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EDITORIAL NOTE

Zamfara International Journal of Education (ZIJE) is the official Journal of the Faculty of Education, Federal University Gusau Zamfara State, Nigeria. The Journal publishes articles of diverse fields of interest in Education. Papers reporting original research and extended version of already established conference and journal articles are welcomed. Papers for publication are selected through peer review process to ensure originality, relevance and readability.

The aim and scope of the journal is to provide an academic medium and an important reference for the advancement and dissemination of information that supports high level learning, teaching and research in the fields of Education.

This edition, Volume 6, Number 1, February, 2026 is poised to present research reports in the following fields of education: Educational Foundations, Science Education, Educational Psychology, Curriculum & Instructional Technology, Guidance & Counselling, Philosophy & History of Education, Sociology of Education, Entrepreneurship education, Special and inclusive Education, Physical & Health Education Religious Education, Gender Studies, Peace & Security Education among Others. The articles in this volume are academic and professional discourse written by reputable scholars in their areas of specialization.

The Board wish to also acknowledge the efforts of the editorial members, for their ceaseless support towards successful publication of the journal. In the same vein, we acknowledge quite sincerely the assistance and support of our esteemed consulting editors for ensuring the credibility of this edition. Also, worthy of appreciation are the Authors and their immense contributions to this publication.

Dr. Umar Sodangi
Editor-in-Chief/ Chairman Editorial Board
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CALL FOR ARTICLES

The Zamfara International Journal of Education (ZIJE) calls for scholarly articles for review and possible publication in its next edition (Volume 6, Number 2, March, 2026), ZIJE publishes articles that emphasizes on research development and application within the fields of Education. All manuscripts are reviewed by editorial review committee. Contributions must be original, not previously or simultaneously published elsewhere, and are critically reviewed before they are published. Papers, which must be written in English language, should have good grammar and proper terminologies. Hence, prospective articles are subjected to plagiarism assessment test to estimate the percentage of originality of the papers. Hence, Plagiarism threshold of ≤20% is recommended.

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1. Manuscripts including references, appendices, tables and diagrams should be double-spaced and single coded on A4 paper with generous margins (at least ½.5cm).
2. Title should be explicit and not more than 19 words.
3. Title page should be arranged as follows: Title, Author (s) full name, affiliation, full addresses, email addresses and phone numbers.
4. Abstract should be single line and not more than 250 words.
5. For conceptual papers, the body should have appropriate headings were necessary
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Manuscripts for Volume, 6. Number, 2. with an evidence of a non-refundable assessment fee of five thousand Naira (N5000:00) only per manuscript should be forwarded electronically to the Editor-In-Chief or Publication Editor via; **zijefugusau@gmail.com** on or before March 30th, 2026. Furthermore, upon acceptance of manuscript for publication a non-refundable publication fee of Thirty Thousand Naira (N30,000:00) will be required for online (e-Book) version only, while Thirty-Five Thousand Naira (35,000:00) only for both online (e-Book) and hard copy versions per manuscripts submission, respectively.

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Effect of Environmental Remediation Packages for Environmental Consciousness among Secondary School Students in Sokoto Metropolis, Sokoto State, Nigeria

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Abstract

The purpose of this research was to find out if environmental remediation methodology can improve environmental consciousness among secondary school students in Sokoto metropolis. Quasi control-experimental group pre-posttest model was employed were 313 students from intact classes of SS2 formed the sample of the study from all public secondary schools within Sokoto metropolis. Students' Performance Test on Pollution (SPTP) with a reliability index of 0.78 was the instrument used for data collection. Descriptive statistics and independent sample t-test were used to analyzed the data (P=0.05). Utilizing environmental remediation packages was found to increase students' environmental consciousness. Result also showed no significant difference between male and female environmental consciousness when taught using environmental remediation packages. To improve environmental consciousness among secondary school students, it was recommended that stakeholders should include environmental remediation as an instructional methodology in the Nigerian secondary school curriculum.

Keyword: Environmental Remediation; Environmental Consciousness; and Secondary School Students.

Introduction

Environmental remediation refers to the different strategies and techniques that are utilized in neutralizing pollution and restoring the health of the environment and it's environ. It involves cleaning-up methods, such as, in-situ and off-situ chemical treatment, bio-remediation, catalytic converters, thermal remediation among others. Environmental remediation in schools play a great role in the teaching and learning process. It helps in enhancing students' comprehension, focus and minimizes distractions thereby producing vibrant, sound and efficient students with a sense of responsibility and environmental consciousness leading to students' environmental stewardship (Meng, Zhang & Lian, 2025). A school environment with minimized or controlled pollution paves way for smooth learning process and attainment of teaching and learning objectives, it helps in attaining economic growth and environmental sustainability when proper waste management strategy is employed such as waste reuse and waste decomposition (Socolovsky, Louisias, Alsulami, Petty & Trivedi, 2025). As environmental remediation is an act of cleaning up of waste and harmful substances, it also deals with the removal, treatment and containment of pollution and contaminants from the soil, ground water and even indoors (De souse & Almeida, 2025). According to Adamu and Abdullahi (2024), environmental education programme on students' environmental awareness and behavior is essential for effective environmental literacy especially using the environmental education kit.

Environmental remediation often starts from assessing health and ecological risk involved in the remediation exercise, which will guide the sampling and chemical analysis to be done. Environmental remediation is categorized into two; ex-situ and in-situ. Ex-situ is done by removing the affected soil and contaminated groundwater while in-situ method involves treating the contamination without removing the soil and groundwater. Approaches to environmental remediation include

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soil excavation and disposal, solidification and stabilization, soil-vapor extraction, permeable reactive barriers, monitored natural attenuation, bioremediation-phytoremediation, chemical oxidation, in-situ thermal desorption among others (Jnj Environmental, 2025). Environmental remediation plays a significant role in promoting public health and maintaining the overall environment, the process allows a reverse the anthropogenic impacts on the land and enable better land productivity and boost the ecosystem (Cactus, 2024). Environmental remediation also helps in improving aesthetics by transforming abandoned lands into parks, green spaces which will beautify the neighborhood, increase the land value, and serve as a source of income thereby improving the economy (Hull's environmental services, 2023). However, some soil remediation techniques are associated with negative impacts on the environment including changes in edaphic conditions and toxic by-products (Biabani, Ferrari & vaccari, 2023). According to Sysco environmental (2024), securing healthy learning environment is paramount, considering the amount of time students and teachers spend in the classroom. Environmental remediation is concerned with assessing the quality of the environment to define ways of reducing pollution (Stein & kerle, 2008). Latham & Jennings (2022) showed that remediation efforts significantly reduced lead in school drinking water in New York City.

Statement of the Research Problem

It has been observed that most public secondary schools' environment in Sokoto Metropolis-Nigeria are found littered in waste, comprising of gutters, stagnant water, used papers, food particles, used containers and plastics, human faeces, solutions from laboratory activities; air pollution as a result of uncleansed toilets and over populated classrooms among others. These pollutants are injurious to health of staff, students and neighbouring communities and also impede academic activities and students' performance. In an attempt to solve this problem a bunch of effort were made. It was reported by Auwal (2021) that the Sokoto State government in its attempt to improve secondary schools' environment established orchards and gardens in twenty-one (21) secondary schools in the State. Yusuf, Abbas & Kabiru (2022) conducted a study to find out the level of water sanitation and hygiene services in public secondary schools in Sokoto State, Sahabi (2024) also carried out research to assess plastic waste management among secondary schools in Gwadabawa local government area of Sokoto State. However, more needs to be done, this study therefore aimed at organizing and carrying out different environmental remediation packages/activities which will equip students with hands-on activities which are age-appropriate for public secondary schools in Sokoto metropolis- Nigeria to increase their environmental consciousness.

Objectives of the study

1. To find the difference in students' environmental consciousness mean score between those taught using discussion methods and those guided using environmental remediation packages in Sokoto Metropolis- Nigeria;
2. To identify the difference between male and female students' environmental consciousness Mean performance on the basis of environmental remediation packages in Sokoto Metropolis-Nigeria.

Research Questions

1. Is there any difference in students' environmental consciousness mean scores between those taught using discussion methods and those guided using environmental remediation packages in Sokoto Metropolis- Nigeria?
2. Does a difference exist between male and female students' environmental consciousness Mean performance on the basis of environmental remediation packages in Sokoto Metropolis-Nigeria?

Hypotheses

1. There a no significant difference in students' environmental consciousness mean scores between those taught using discussion methods and those guided using environmental remediation packages in Sokoto Metropolis- Nigeria
2. There is no significant difference between male and female students' environmental consciousness mean performance on the basis of environmental remediation packages in Sokoto Metropolis-Nigeria?

Methodology

The study employed quasi experimental design. It is made up of control-experimental group in a pretest- treatment- posttest model. The population of the study comprised of all public secondary school students in Sokoto Metropolis-Nigeria, which are majorly hausa-fulani by tribe and are Muslims by religion with an average age of 15years. The study was delimited to SS2 students and the topic air and land pollution. Multistage sampling technique was used. Four secondary schools were randomly sampled from all public schools within the metropolis; two all-boys and two all-girls randomly assigned to control and experimental groups. Intact classes of SS2 was chosen conveniently as the topic air and land pollution and its

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remediation is taught at that level. Participants of the study is made up of 313 students of which 223 are male and 90 females. The control group is made up of one male school and one female school, it was treated the topic air and land pollution for a period of six (6) weeks using discussion method. The experimental group was treated the same content using environmental remediation packages. Environmental Remediation activity schedules was designed and used as treatment for students in the experimental group. It is made up of age appropriate environmental remediation activities suitable for secondary school students under the guidance and supervision of the instructor. Students' Performance Test on Pollution (SPTP) was the instrument for data collection. It is a researcher designed 15-items 4-options objective test drawn from the environmental remediation activity schedules. SPTP was validated by experts in test and measurement and experienced secondary school teachers. To test its reliability, test-retest method was used on a pilot study of 30 students from Government Girls' Secondary School Runjin Sambo who were among the population of the study and an index of 0.78 was obtained using Pearsons' Product Moment Correlation Coefficient (PPMCC).

Participants of the study were grouped into control and experimental group, SPTP was administered to both groups as pre-test before treatment to ascertain the homogeneity of the groups, then the experimental groups were taught air and land pollution using environmental remediation packaged/activities while the control group was taught using discussion method for a period of six weeks. SPTP used again as post-test to find out which of the group lead to more environmental consciousness among the students. Data collected was analyzed using descriptive statistics of means and standard deviations and t-test of independence at 0.05 level of significance. All statistical analyses were carried out using the software Statistical Package for Social Science (SPSS)

Presentation of Results

Research Question 1

Is there any difference in students' environmental consciousness mean scores between those taught using discussion methods and those guided using environmental remediation packages in Sokoto Metropolis- Nigeria?

Table 1: Mean performance of students Between Discussion Method and Environmental Rem. Packages

S/N	Variable Name	Mean	Std. Deviation	Decision
1	Discussion Method	15.25	4.04	There is difference
2	Environmental Rem. Package	22.06	3.88	

Field work, 2025

Table 1 presented the descriptive statistics of students' environmental consciousness mean performance for those taught using the discussion method and those taught using environmental remediation packages. The result showed that students who were taught using the discussion method, recorded a lower mean score compared to students who were taught using environmental remediation packages. The mean difference further suggests that students taught with environmental remediation packages demonstrated better environmental consciousness than their counterparts in the control group.

Give a brief description of the statistics in Table 1 and show whether the analysis really answers the research question or not.

Research Question 2

Does a difference exist between male and female students' environmental consciousness Mean performance on the basis of environmental remediation packages in Sokoto Metropolis-Nigeria?

Table 2: Mean performance Between Male and Female Students through Environmental Rem. Packages

S/N	Variable Name	Mean	Std. Deviation	Decision
1	Male	21.97	4.21	There is difference
2	Female	22.29	2.95	

Field work, 2025

Table 2 presents the descriptive statistics of male and female students' environmental consciousness mean performance based on the environmental remediation packages. The result shows that both male and female students recorded relatively similar mean scores. However, female students had a slightly higher mean performance compared to their male

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counterparts. The small mean difference indicates that the variation in environmental consciousness performance between male and female students exposed to environmental remediation packages is minimal.

Hypothesis 1

There a no significant difference in students' environmental consciousness mean scores between those taught using discussion methods and those guided using environmental remediation packages in Sokoto Metropolis- Nigeria

Table 3: Independent Samples t-Test of Students' Environmental Consciousness Mean Performance on Discussion Method and Environmental Remediation Packages

S/N	Variable	Mean	F	T	Df	P-value	Decision
1	Disc, Method	15.25					
2	Env. Rem.	22.06	6.011	-15.203	311	0.000	H1 Rejected

Field work, 2025

Table 3 shows the independent samples t-test result comparing students' environmental consciousness mean performance between those taught using the discussion method and those taught using environmental remediation packages. The result revealed a calculated t-value of -15.203 with a degree of freedom of 311 and a p-value of 0.000, which is less than the 0.05 level of significance. This indicates that there is a statistically significant difference between the mean performances of the two groups. Students taught using environmental remediation packages recorded a higher mean score than those taught using the discussion method. Consequently, the null hypothesis was rejected

Hypothesis 2

There is no significant difference between male and female students' environmental consciousness mean performance on the basis of environmental remediation packages in Sokoto Metropolis-Nigeria

Table 4: Independent Samples t-test Analysis of Gender Difference in Post-test Mean Scores on Env Rem.

S/N	Gender	Mean	F	t-value	df	P-value	Decision
1	Male	115					
2	Female	48	2.03	-0.489	161	0.156	Ho_2 Accepted

Field work, 2025

Discussion of Findings

Findings from hypothesis 1 indicate that students taught using the environmental remediation packages demonstrated considerably higher environmental consciousness mean performance compared to those taught using the traditional discussion method. This descriptive outcome aligns with recent empirical evidence by Adamu and Abdullahi (2024) suggesting that instructional approaches that actively engage students with real-world environmental problems and experiential learning tasks tend to produce better learning outcomes than conventional teacher-centred strategies. For example, pedagogical strategies that involve collaborative, contextually grounded activities have been shown to enhance students' environmental knowledge and pro-environmental attitudes more effectively than lecture-based methods, as these strategies stimulate critical thinking and active engagement with content (Xiong, & Zhu, 2025). Similarly, integrating innovative and learner-centred practices in environmental education has been associated with improved comprehension and application of ecological concepts, which supports the superiority of remediation-oriented instruction observed in this study (Muhammed, 2024). This study's findings suggest that when students are provided with structured materials and tasks that highlight environmental issues and remediation, they may develop deeper awareness and reflective thought about environmental phenomena compared to peers exposed to discussion-only methodologies

The findings related to hypothesis 2 revealed that there was no significant difference between male and female students' environmental consciousness mean performance when taught using the environmental remediation packages. Although slight variations were observed in the mean scores of male and female students, these differences were not substantial enough to indicate a gender-based performance gap. This outcome is consistent with recent empirical studies which suggest that learner-centered and activity-based instructional approaches tend to minimize gender disparities in learning outcomes. For instance, Okorie and Ahmed (2021) reported that when students are exposed to structured environmental education

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interventions that emphasize practical engagement and problem-solving, gender differences in achievement become negligible. Similarly, a study by Zhao, Li, and Wang (2022) found that remediation-based environmental instruction produced comparable gains in environmental awareness and responsibility among male and female secondary school students. These findings suggest that the inclusive nature of environmental remediation packages characterized by hands-on activities, collaborative tasks, and real-life environmental contexts provides equal learning opportunities for all learners regardless of gender. The results further align with Adeyemi (2023), who observed that instructional strategies emphasizing experiential learning and contextual relevance tend to neutralize traditional gender performance gaps commonly reported in conventional teaching approaches. Therefore, the result of this study implies that environmental remediation packages are gender-neutral in impact and effective in fostering environmental consciousness equitably among students. This reinforces the view that instructional quality and strategy selection are more critical determinants of learning outcomes than gender differences, especially in environmental education contexts

Conclusion

The research concluded that environmental remediation packages has the capacity and potential to improve students' environmental consciousness and the method is suitable for both male and female students.

Recommendations

Based on the findings of the study, it is recommended that:

1. Stakeholders should include environmental remediation packages as instructional technique or method in the Nigerian secondary school curriculum.
2. Environmental remediation packages/ activities should be practiced among all students irrespective of their gender

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Impact of Budgeting System on Management of Public Tertiary Institutions in Benue State, Nigeria

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Abstract
This study focused on the Impact of Budgeting System on Management of Public Tertiary Institutions in Benue State, Nigeria. Specifically the study evaluated the extent adequate budgeting addresses the operational needs of Benue State Tertiary Institution, determine whether adequate budgeting ensures the provision facilities required to improve and sustain the effectiveness of Benue State Tertiary Institutions examines the relationship between adequate budgeting and the maintenance of essential tertiary institution infrastructure and resources in Benue State, analyzed the extent adequate budgeting facilitates the professional development and welfare of Tertiary institution staff in Benue State and investigated the challenges faced by the Benue State Tertiary Institution in achieving and maintaining adequate budgeting. The survey design was adopted for the study. The population size comprises staff in Benue State Tertiary Institutions. The findings revealed that the extent to which adequate budgeting addresses the operational needs of the Benue State Tertiary Institution is significantly high. However, the findings of the study reveal that there is a direct and positive relationship between adequate budgeting and the maintenance of essential tertiary institution infrastructure and resources in Benue State. Therefore, it is recommended that government should adopt modern financial management systems and practices to improve efficiency and transparency in budget processes. Also, government should engage stakeholders, including tertiary institution staff and the public, in the budgeting process to ensure that the needs and priorities of the tertiary institution are adequately reflected.

Keywords: *Budgeting, Management, Public Tertiary Institutions,*

Introduction
One of the most crucial strategies developed to facilitate the effective performance of management functions is budgeting. A budget is essentially a plan expressed in monetary terms, prepared and approved for a specific period, typically outlining the expected income to be generated or the expenditure to be incurred during that time, as well as the capital employed to achieve a particular objective (Ben-Caleband Agbude, 2022). However, various definitions of a budget have been provided by different authorities; economists, for instance, define it as an official document that details the anticipated revenue and projected expenditure for a given fiscal year. The importance of a budget in any economy cannot be overstated. Beyond serving as a mechanism for resource mobilization and allocation, a budget is also a crucial tool for economic management (Olomola, 2019; Government Integrated Financial Management Information System (GIFMIS), 2011). This is because the budget document sets the direction for the entire economy, determining resource distribution and timing, and providing funds for new initiatives and policies through legal, rational, and acceptable means (Bengali, 2004). Indeed, it would be extremely challenging, if not impossible, for any government in a modern economy to achieve its vision for a fiscal year without the use of budgeting (Olomola, 2019). Consequently, the development of a national budget is often regarded as the government's most critical activity each year (Government Finance Officers Association (GFOA), 1999; National Democratic Institute (NDI), 2003). However, for a budget to serve as an effective tool for fiscal and macroeconomic management, both the budgeting process and budget management must be robust.

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Objectives of the study

1. Evaluate the extent to which adequate budgeting can addresses the operational needs of Benue State Tertiary Institution.
2. Determine whether adequate budgeting ensures the provision facilities required to improve and sustain the effectiveness of Benue State Tertiary Institution.

Research Questions

1. To what extent does adequate budgeting address the operational needs of Benue State Tertiary Institution?
2. Does adequate budgeting ensure the provision of facilities required to improve and sustain the effectiveness of Benue State Tertiary Institutions?

Hypotheses

Ho: Adequate budgeting has no significant impact on the management of public institutions.

Methodology

A research methodology is a research process employed or adopted to scientifically and systematically present the results of a study to the research audience viz a vis the study beneficiary.

Population of the Study

According to Udoyen (2019), a study population is a group of elements or individuals as the case may be, who share similar characteristics. These similar features can include location, gender, age, sex or specific interest. The emphasis on study population is that it constitutes of individuals or elements that are homogeneous in description. This study was carried out to examine the impact of adequate budgeting in the management of public institutions using Benue State Tertiary Institutions as a case study. Staff of finance department in Benue State Tertiary Institutions form the population of the study.

Sample Size Determination

A study sample is simply a systematic selected part of a population that infers its result on the population. In essence, it is that part of a whole that represents the whole and its members share characteristics in like similitude (Udoyen, 2019). In this study, the researcher adopted the convenient sampling method to determine the sample size.

Sample Size Selection Technique and Procedure

According to Nwana (2005), sampling techniques are procedures adopted to systematically select the chosen sample in a specified away under controls. This research work adopted the convenience sampling technique in selecting the respondents from the total population.

Method of Data Collection

Two methods of data collection which are primary source and secondary source were used to collect data. The primary source was the use of questionnaires, while the secondary sources include textbooks, internet, journals, published and unpublished articles and government publications. The reason for using both primary and secondary source of data is, so that the researcher will have concrete and more valid answers to the research questions

Data Presentation and Analysis

Data Presentation

The table below shows the summary of the survey. A sample of 36 was calculated for this study. A total of 30 responses were received and validated. For this study a total of 30 were used for the analysis.

Distribution of Questionnaire Table 1

Questionnaire	Frequency	Percentage
Sample size	36	100
Received	30	83.3
Validated	30	83.3

Source: Field Survey, 2024

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Data Presentation

Demographic profile of the respondents Table 2

Demographic information	Frequency	percent
Gender		
Male	17	56.7%
Female	13	43.3%
Age		
25-30	9	30%
31-36	8	26.7%
37-42	6	20%
43+	7	23.3%
Marital Status		
Single	19	63.3%
Married	11	36.7%
Education Level		
BS.c	25	83.3%
MS.c	5	16.7%

Source: Field Survey, 2024

Descriptive Analysis

Question 1: To what extent does adequate budgeting address the operational needs of the Benue State Tertiary Institution?

Respondents on question 1Table 1

Options	Frequency	Percentage
High	15	50.0
Low	4	13.3
Undecided	11	36.7
Total	**30**	**100**

Field Survey, 2024

From the responses obtained as expressed in the table above, 50.0% of the respondents said high, 13.3% of the respondent said low, while the remaining 36.7% of the respondent were undecided

Question 2: Does adequate budgeting ensure the provision of facilities required to improve and sustain the effectiveness of the Benue State Tertiary Institution?

Respondents on question 2 Table 2

Options	Frequency	Percentage
Yes	17	56.6
No	4	13.3
Undecided	9	30
Total	**30**	**100**

Field Survey, 2024

From the responses obtained as expressed in the table above, 56.6% of the respondents said yes, 13.3% of the respondent said no, while the remaining 30% of the respondent were undecided

Discussion of Findings

Based on the analysis conducted and presented above, the study reveals several key findings. Sequel to the first research objective, the analysis reveals a profound impact of adequate budgeting on the operational efficiency of public institution. Furthermore, the provision of essential facilities through adequate budgeting is pivotal in enhancing and sustaining the court's effectiveness. When resources are allocated appropriately, the tertiary institution can invest in necessary infrastructure, such as modern lecture room technologies, adequate office spaces, and proper maintenance of existing facilities. Despite these benefits, the Benue State Tertiary Institution faces several challenges in achieving and maintaining adequate budgeting. Limited financial resources and competing demands from other sectors often strain the available budget, making it difficult to allocate sufficient funds to the tertiary institution. Additionally, political interference and corruption can further complicate the financial management process, leading to misallocation and mismanagement of funds. Economic fluctuations and fiscal deficits at the state level also pose significant risks to maintaining a stable budget.

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Conclusion

The findings of this study reveal that the extent to which adequate budgeting addresses the operational needs of the Benue State Tertiary Institution are significantly low. However, by ensuring that sufficient financial resources are allocated to cover essential activities. These activities include administrative functions, case management, and day-to-day operations. Additionally, the study findings shows that adequate budgeting ensures the provision of facilities required to improve and sustain the effectiveness of the Benue State Tertiary Institution. When the budget is sufficient, it allows for the construction, maintenance, and upgrading of court facilities, including courtrooms, offices, and technology infrastructure. Furthermore, the result shows that there is a direct and positive relationship between adequate budgeting and the maintenance of essential tertiary institution infrastructure and resources in Benue State. Moreover, adequate budgeting plays a crucial role in facilitating the professional development and welfare of tertiary institution staff in Benue State.

Recommendations

Based on the responses obtained, the researcher proffers the following recommendations to the government of Benue state:

1. Implement regular training programs for tertiary institution staff on budget preparation, execution, and financial management.
2. Adopt modern financial management systems and practices to improve efficiency and transparency in budget processes.
3. Engage stakeholders, including tertiary institution staff and the public, in the budgeting process to ensure that the needs and priorities of the tertiary institution are adequately reflected.

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Leveraging Preservice Teacher Education Curriculum in Higher Institutions of Learning: A Panacea for Addressing Security Challenges in Nigeria

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Abstract
Security remains a fundamental pillar of any progressive society. In Nigeria, a nation blessed with diversity, natural resources, and vibrant human capital, the persistent wave of insecurity has continued to cast a long shadow over its developmental aspirations. While military and policing strategies are often prioritized, education, particularly the education of future teachers, holds untapped potential in the promotion of peace and national cohesion. This paper delves into the role of preservice teacher education in addressing Nigeria's security challenges. It explores the ways in which the curriculum can foster critical thinking, peacebuilding, tolerance, civic responsibility, and social justice. Ultimately, it proposes a bold reimagination of teacher education to position educators not just as transmitters of knowledge, but as builders of a more secure, just, and peaceful Nigerian society.

Keywords: Insecurity, Pre-service Teachers, Curriculum

Introduction
Nigeria stands at a crossroads. With escalating incidents of terrorism, banditry, cybercrime, kidnapping, ethnic violence, and separatist agitations, the question of national security has taken center stage in public discourse. Security, in its broadest sense, transcends the absence of violence. It encompasses human dignity, access to education, economic opportunities, and the assurance of justice. Unfortunately, efforts to address these issues have remained reactive, fragmented, and often exclusionary of one of the most potent tools of change: education. Teachers are nation builders. They are the architects of conscience and character, shaping the minds and attitudes of young citizens. It follows then that preservice teacher education is not just an academic exercise but a strategic intervention point for societal transformation. If Nigeria is to rise from its security quagmire, then the curriculum that prepares its future educators must be revisited, reformed, and revitalized.

Security is the state of being secured from what would make you feel afraid, and or feel threaten. Cambridge (2021) defined security as protection of a person, building, organisation, or country against threats such as crime or attacks by foreign countries. According to Collins English Dictionary (2021), it is the state of being secured or having freedom from fear, anxiety, danger, doubt; state of safety or certainty. Dasuki (2013) defined security to be absence of insecurity as a result of actions of law enforcement agencies stressing that security is understood to be the job of the defense force of the national frontiers and of the police inside the country.

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Security is the degree of protection against danger, damage, loss and crime. Security is a form of protection consists of structures and processes that provide or improve security as a condition. Security is defined as a form of protection where a separation is created between the assets and the threat. Furthermore, security is a state of resistance to any type of behaviour that causes harm or damage to a person or property. Security can also be defined as protection against criminals, thieves and threats (Buzan and Hansen, 2009). There are different dimensions of security, it can be economic security, food security, health, environmental, personal, community/national and political security (UNDP, 1994), which have all permeated the Nigerian society which is why we always refer to the term as national security. Human security is concerned with weapons, it is concerned with human life and dignity (UNDP, 1994). It is defined as an encompassing condition in which people, and communities live in freedom, peace and safely enjoy the protection of vital freedom. It means protecting people from critical and pervasive threats and situations, buildings on their strength and aspirations. It also means creating systems that give people the building blocks, dignity, and inhabits ones environment which is not detrimental to their health and wellbeing. Security basically refers to the totality of measures undertaken to ensure protection of lives and properties. It was averred that security is a protection or defense of people against all kinds of victimization including protection from external military, economic want, poverty, illiteracy, disease or ill-health, political exclusion, social exploitation, criminality act, among others (Odekunle, 2012). It is important to note that since the end of the cold war, there appear to be a shift from viewing security from state-centric perspectives to a broader view that place emphasis on individual. In which national security also encapsulates human security, human right and national development. It was explained further that security is any mechanism devised to alleviate the most serious threats that prevent people from pursuing their cherished values (Audu, Lukeman and Mohammed, 2014). According to Iredia (2011), national security simply means the capacity of a state to overcome challenges confronting her. He added that national security is not limited to military might, defense or law enforcement, it covers basic dimensions like job, water and food security. Oyegun (2012) described the security situation in Nigeria as a litany of unfulfilled dreams and disappointment. He observed cases of unrealised potentials, poverty in the midst of wealth, total lack of inspiration held for by insecurity due to incessant crimes and abject poverty. There are various symptoms of social disorganization and vices which have become overt and easily noticeable with; prostitution in urban centers; drug use/abuse and associated ailments; direct and indirect child abuse; child trafficking; severance of disregards for community values; general indiscipline; violent disorder; and ethno-religious conflicts. All of these have generated into insecure environment and has called for the need to re-organise, strengthen and re-direct the delivery of functional, moral and value education in the broadest possible sense in our education system in such a manner as to effect the younger generation positively to build their level of consciousness as they seek to make the choices that will determine their future.

Concept of Insecurity

Insecurity can be regarded as the state of lacking confidence or assurance of something or somebody or group of people, having no self-doubt or state of being insecured. The prevalence of insecurity and its negative effects on the individual citizens and the society at large is seriously impinging the development of the Nigerian society if left unaddressed. This is because most people who engaged in these vices of insecurity are youths who should be the one who are supposed to constitute quality human resources needed to drive the developmental strides in Nigeria. Hence, the incidence of insecurity amongst the youths calls for efforts to stem it if not eradicate it totally. Insecurity is the state of fear or anxiety, stemming from a concrete or alleged lack of protection. It is lack of or inadequate freedom from danger. Physical insecurity is the most visible form of insecurity, and it feeds into many other forms of insecurity such as economic security and social security. King (2016), a renowned security expert suggested that for government to tackle insecurity, a key starting point should be to understand the causes of insecurity as well as to investigate their sources of social disorder and instability. King pointed out that it is necessary to provide a holistic view to the suggestion or recommendations of solutions. More often, however, policy makers have not stated the particular causes and they prefer blanket references, with the consideration that the causes of insecurity are interwoven and contributory to one another. Like in many other societies, the sources of insecurity in Nigeria has been classified or grouped into external and internal factors. Beyond the external-internal dichotomy, sources of insecurity have also been classified either remote or proximate and immediate sources/causal factors. In Nigeria, the challenge is not so much about insecurity of external sources, but rather that of internal sources. Some internal factors have been enhanced and strengthened by the presence of external forces, but there is no doubt that, if the internal situations did not present themselves, the external forces would be unable to infiltrate.

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Quite disturbing is the escalation of violence, problems of insecurity, religion and ethnic tension, criminal activities, kidnapping, the deadly Boko Haram. This insecurity is taking alarming dimensions in various regions of the country, even though there is no country that is free of violence and crime, but when a nation begins to have organised groups like the Boko Haram, Fulani herdsmen, armed banditry. Then, it informs us that the apparatus of the state for maintaining security, law and order is being threatened. And when we analyse the age brackets of these criminals, it also informs us about the rate of unemployment in the country that cannot accommodate her youths. The gift, or extortion and generally have a significant impact on the people in their locales region or the country as a whole. Similarly, the United Nation convention against transnational organized crime (Article 2 (9) states that an "organised criminal group shall mean a structured group of three or more persons, existing for a period of time and acting in concert with the aim of committing one or more serious crime offences established in accordance with the convention in order to obtain directly or indirectly a financial or other material benefit. The problem requires robust structured analytic thinking for its resolution and also, security experts and law enforcement agencies needs intelligence gathering analysts to use a powerful analytic tools such as morphological analysis. The will enable the analysis array the threat analytic data into a matric set up the dimensions of the problems and possible examine permutation of different combination of the matrices (Howard, 2013, Micheal, 2009, Jeffrey, 2009).

National Security

National security is the absence of threats faced by the state (threats which aimed at state's values and interests). Society security deals with identities and cultures and can easily lead to politics of discrimination and exclusion. Their focus is on any aggression against the goals and interests of the state. Such interests and values are peace and general well-being of the masses, assurance of life and health of citizens, and other acceptable norms and conduct within the state, which government oversees. In this case, any attempt to unleash terror on citizens, even a single citizen of a country is a national threat. For national security, there should be protection against hunger, epidemics and external aggression. National security is different from societal security in the sense that, societal security is concerned with security "outside the state" or "beside the state" to them, national security is seen as political security. Security at all levels is sacrosanct to peaceful co-existence of the people and it is a catalyst for national development and economic growth. Buzan (1981) presents the perspective of a more complex security complex, by describing security based on levels and sectors. The three levels he mentioned are individual, state and international sectors. Protecting an individual against the unforeseen attack of nature and man is part of national security, also protecting the state resources from wastage and securing the state against internal criminalities, that could bring pain to or hurt the government and the generality of people is national security. National security is about maintaining a healthy international relationship with other countries, signing bilateral treaties and security pact with other countries. It is generally the protection of the country from external and internal aggression. Adoyi (2019) further observed that since 1947, national security has been institutionalised as philosophy, law, policy, strategy and structures, institutions and individuals to take on a life of its own. The meaning of national security is so deep rooted that it is covered by consistency of expositions, practices, conventions, scholarships, media analysis, movies, documentaries, awards, and endowments over the course of several decades to avoid any ambiguity whatsoever. Security is presently a major challenges in Nigeria, even though the government claims to be on top of the situation yet the problem persists. Thus, National security, a concept understood by some as an abstract notion relating to the condition of the state, and referred to in security and intelligence legislation. Adoyi (2019) conceptualised national security as the members of the law enforcement defense establishment appropriate national security as their own. They confronted domestic challenges occasioned by the failure of Nigeria's military government to provide adequate security. Ammerdown (2016), asserts that national and international security may be understood as a shared freedom from fear and want, and the freedom to live in dignity. Prabhakaran (2008), argues that national security is the measurable state of the capability of a nation to overcome the multi-dimensional threats to the apparent well-being of its people and its survival as a nation-state of any given time, by balancing all instruments of state policy through governance and is extendable to global security by variables external to it. United Nations Development Programme (UNDP, 1994) human security may include absent of Chrome threats, such as hunger, disease and repression. However, national security is the defence of a country against internal and external threat to national unity, cohesion, peace, aspiration and goals. Adoyi (2019), conceptualised national security as the members of the law enforcement defense establishment appropriate national security as their own. They confronted domestic challenges occasioned by the failure of Nigeria's military government to provide adequate security. Adoyi (2019), further observed that since 1947, national security has been institutionalised as philosophy, law, policy, strategy and structures, institutions

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and individuals to take on a life of its own. The meaning of national security is so deep rooted that it is covered by consistency of expositions, practices, conventions, scholarships, media analysis, movies, documentaries, awards, and endowments over the course of several decades to avoid any ambiguity whatsoever. Security is presently a major challenges in Nigeria, even though the government claims to be on top of the situation yet the problem persists. Thus, national security, a concept understood by some as an abstract notion relating to the condition of the state, and referred to in security and intelligence legislation. National Security can be defined to mean "the sum total of actions and measures, including legislative and operational procedures, adopted to ensure peace, stability and the general wellbeing of a nation and its citizens (Shinkaiya, 2004). In strategic studies, security has an objective and subjective meanings. At the objective level, security measures the absence of threat of life, liberty, property and core value (Wolfers, 1954). At the subjective or apprehension of being in danger of losing life, liberty, property and core values. According to Lippmann (1987) "a nation is secure to the extent that it is not in a position to lose core values; life, property and liberty and if it wishers, to deter aggression or win war when unavoidable". Security can be defined as the protection of a nation from all types of external aggression, espionage, hostile reconnaissance, sabotage, subversion, annoyance and other inimical influence. This definition however, views national security in the classical concept in terms of the survival of the state and protection from external aggression through the use of the military.

Sources of Insecurity

Remote or Root Factors

Lack of institutional capacity resulting in government failure. This result from what Fukuyama (2004) described as the corrosion or breakdown of institutional infrastructures. The foundations of institutional framework in Nigeria are very shaky and have provoked a deterioration of state government and democratic accountability, thus, paralysing the existing set of contraints including the formal and legitimate rules nested in the hierarchy of social order. Evidently, Igbuzor (2011) observed that the state of insecurity in Nigeria is greatly a function of government failure, or can be linked to government failure. this is manifested by the capacity of government to deliver public services and to provide basic needs of the masses. Lack of basic necessities by people in Nigeria has created a pool of frustrated people who are ignited easily by any event to be violent.

Pervasive Material Inequalities and Fairness

Greater awareness of disparities in life chances is a major root cause of insecurity in Nigeria. This is a rooted general perception of inequality and unfairness which has resulted in grievance by a large number of people. The perception stems from the perception of marginalisation by a section of the people, government development policies and political offices and this has become a primary source of disaffection and resentment. Onuoha (2011) noted that a large number of the Nigerian population is frustrated and have lost hope, especially the youths, and have now emerged to expres their disillusion about the pervasive state of inequality.

Ethno-Religious Conflict

These have arisen from distrust among various ethnic groups among the major religions in Nigeria. Salawu (2010) and Igbuzor (2011) identified ethno-religfious conflict as a major source of insecurity in Nigeria. It is a situation in which relationship between members of one ethnic or religious group and another of such group, in a multi-ethnic and multi-religious society is characterised by lack of cordiality, mutual suspicion and fear, and a tendency towards violent confrontation.

Conflict of Perceptions Between the Public and Government

Over the years, there has been a standing mismatch between public and government perceptions. A situation which often result in the reactions of the public to the excesses of the military regimes which governed Nigeria nad has continued after the end of military regimes and created a sensitivity by those in government at public intrusion in matters of state. Frequently, on any given incident, public and government reactions diverge. In such situations, the media has never helped matters. Media practices have always focused on the dramatic and the specular view of the given situations. Such reports have always been capitalised on in sophisticated ways by various groups, some of which are violent to incite public clamour for a change and immediate reaction through strategically provocative violence.

Weak Security System

This results from inadequate equipment for the security arm of government, both in weapon and training. this is in addition to poor attitudinal and behavioural disposition of security personnel. In many cases, security personnel assigned to deal

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with given security situations lack the expertise and equipment to handle the situations in a way to prevent them from occuring. And even when these exists, some personnel get influenced by ethnic, religious or communal sentiment and are easily swallowed by their personal interest to serve their people, rather than the nation.

Concept of Security Planning

Security planning can be described as a process of establishing objectives, allocating resources within prescribed or authorised budgetary limitations, and determining what should be done, how it should be done, and how soon it should be set into operation. It is the security manager's responsibility to determine what the security objectives should be, what the goals in each area of objectives should be. He decides what has to be done. Reach the objective that is definition of ends, and the determination of appropriate means of achieving the desired ends. He decides on who should do what; how it should be done; when to do it and where to do it. Consequently, this aspect of his job involves hard thinking since it is future oriented. Security planning, in the main, requires specificity and purposefulness. Most importantly, the process of planning involves establishment of standards (against which actual performance will be compared), thus, the importance of control to prevent deviation, developing rules, regulations and standard operating procedures, developing the road map which will help the security manager to decide for one or more specific course of action. For example, if a company's objective is higher profits and the widespread prevalence of employee theft is eating away those profits, a primary objective of the security function should be to reduce employee theft, and thus contribute to the corporate objective of increased profits. This paper sets out to examine how the preservice teachers curriculum impacts security in Nigeria. It seeks to inspire curriculum planners, policymakers, teacher educators, and student-teachers to see education not merely as a means of literacy acquisition, but as a powerful instrument for peace, social integration, and national renewal.

Challenges Facing the Preservice Teachers Curriculum in Nigeria

Inadequate Curricular Coverage: Although most teacher education programmes include elements of civic education and moral instruction, these are often treated superficially. Content specific to conflict resolution, countering violent extremism, and digital security is largely absent. The result is a curriculum that is disconnected from the socio-political realities of the country.

Emphasis on Theory over Praxis: There is a marked gap between knowledge and application. Lectures remain heavily theoretical, with minimal opportunities for student-teachers to engage in simulations, peacebuilding projects, or community engagement activities. Yet, the classroom must be a microcosm of society, preparing teachers to model and teach empathy, resilience, and conflict management.

Lack of Critical Thinking and Media Literacy: In an age where misinformation fuels violence and social media is weaponized for propaganda, it is alarming that preservice teachers are not being trained in media literacy and critical thinking. These skills are essential in helping learners distinguish fact from fiction, resist radical ideologies, and engage in respectful discourse.

Teacher Preparedness and Attitudes: While many student-teachers demonstrate a passion for national development, they often feel unprepared to tackle issues of violence, radicalization, and student conflict in their future schools. There is a consensus on the need for curriculum reform to reflect current challenges.

Inspiring Change: Reimagining the Curriculum for Security

Education for Peace and Unity: Courses in peace education should be made compulsory across all teacher education programmes. These should cover dialogue techniques, trauma-informed pedagogy, non-violent communication, and intercultural understanding. Nigeria's diversity must be celebrated in the classroom, not feared.

Community-Based Learning: Student-teachers should undertake service-learning projects in communities affected by conflict. This will not only ground their knowledge but foster empathy, leadership, and a deeper understanding of societal dynamics.

Infusion of Digital and Media Literacy: Curricula must include training on digital citizenship, cyber-security, and responsible media engagement. Teachers must be able to guide students through the digital landscape with integrity and discernment.

Promotion of Democratic Values: Preservice teachers should be immersed in democratic practices: participatory decision-making, student councils, open debates, and inclusive classroom management. These practices will become templates for the societies they will one day shape.

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Recommendations

The following recommendations are made:

1. The Federal Ministry of Education should work with the National Commission for Colleges of Education (NCCE) and National Universities Commission (NUC) to integrate peace and security education into teacher education standards.
2. Continuous training for teacher educators on peacebuilding and transformative pedagogy.
3. Establishment of mechanisms to assess the implementation and impact of security-related curriculum content.
4. Partnerships between universities, civil society, and security agencies to co-create resources and provide experiential learning opportunities.

Conclusion

Nigeria's quest for peace and security will not be won solely through weapons and warfare. It will be achieved in classrooms, in conversations, and in communities. It will be driven by educators who inspire a generation to choose dialogue over division, hope over hate, and unity over conflict. The preservice teachers' curriculum must rise to this challenge. Let us empower our future teachers not just with knowledge, but with vision; not just with methods, but with mission. In doing so, we will plant the seeds of a more secure, inclusive, and prosperous Nigeria, one classroom at a time.

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Assessment of Rural-Urban Migration among Irrigation Farmers in Kano North Senatorial District of Kano State, Nigeria

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Abstract

This study investigated assessment on scope and challenges of rural-urban migration among irrigation farmers in Kano North Senatorial District, Kano State. Two research questions were formulated for the study. The design for this study was descriptive survey research. The population of the study was six thousand two hundred and eighty seven (6,287) irrigation farmers in the study area, simple random sampling techniques were used to select the sample size of 361 respondents. Researcher developed questionnaire titled: Questionnaire on irrigation farming and reduction of rural-urban migration (QIFRRUM). The instrument for data collection was a 10 items questionnaire which was validated by research experts and tested with a reliability estimate of 0.68 using Pearson Product Moment Correlation (r) (PPMC). The data collected were analyzed using mean and standard deviation. The findings which emerged from the scope of irrigation rural development programmes includes cultivation of cereals, fruits, vegetables and perishables, poultry production, livestock production, marketing of agricultural produce, transporting products to markets, providing labour and selling inputs to farmers; the challenges facing the irrigation farmers indicate inadequacy of fertilizers and water pump machines, inability to access loan schemes, and inefficient extension services. It was recommended among others things that: government should provide agricultural inputs and farming technologies to irrigation farmers to improve the production level. and credit facilities provided for irrigation farmers to improve their agricultural production, which will lead to the improvement of marketing between companies and farmers: government should intensify efforts in the provision of adequate fertilizers and water pump machines, access to loan schemes to irrigation farmers, adequate technical advice and the provision of efficient extension services, communication and adequate capacity building in order to determine the challenges facing irrigation farmers in the Kano North Senatorial District, Kano State Nigeria.

Keyword: Support, Challenges, Rural-Urban Migration

Introduction

The practice of rural development has been a global phenomenon as well as an age-long intervention effort by governments, non-governmental organizations and philanthropic foundations. Rural development generally denotes the processes leading to sustainable improvement in the quality of life of rural people especially the poor (Singh, 2002). In most developing countries of the world, rural areas occupy more geographical space than urban centers. This is why most rural locations are predominantly agriculture-based. In other words, majority of the people living in the rural areas of most developing nations are practicing subsistence agriculture (farming) as a way of sustaining their livelihood (Abbas, 2016). In many developing nations, there had been a rapid growth of urban populations more than that of rural population due to migration (Andersen, 2013). In Africa, for instance, it has been estimated that between 1990 and 2020 there had been added at least 500 million people to the existing urban population compared to the less than 200 million people in North America and Europe (USAID, 2002). Such rapid urban growth in these African countries, including Nigeria, started even before independence. Nigeria is a typical example of this rapid urban growth, where there had been a tremendous expansion of urban areas, resulting in rapid urbanization at the expense of rural location and leading to rural-urban migration (Ledant, 1982). However, the phenomenon of people migrating to other areas in search of a better life is not a novel one because the nexus of migration either rural-urban or urban-urban with development or otherwise is a subject of debate. Therefore, rural-urban migration results from the search for perceived or recalled opportunities as a result of rural urban inequality in wealth. This inequality is as a result of the imbalance in the provision of social amenities for communities. According to NBS (2014), Erringe (2012) and Muaghalu (1992) clearly there was an increase in the rate of rural-urban migration. But the condition of rural areas can be best explained by the nature of the migration of the rural populace into urban areas. For instance, there is a clear imbalance between rural and urban areas in terms of infrastructural provisions and social amenities. These situations affect the nature and system of social production, productivity and social and physical infrastructure as well as worsen the poverty level among rural residents. Hence, migration reduced the production of food and per capita income of rural areas.

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Furthermore, migration into urban areas brings about a lot of social rural and urban transformation. Some of these social transformations include the mass exodus of people from rural to urban areas, which brings about over-population at urban areas and results to an increase in kidnapping, armed robbery and other social vices. In the rural areas of the Kano North Senatorial District, both raining and dry season agriculture are being practiced. In this area, rural-urban migration is hitherto on the increase. Many youths and adults migrate to cities like Kano, Lagos, Onisha, Aba, Warri, Maiduguri, Port-Hacourt and for the purpose of searching for income, employment, trading, leisure and so on (Ali,2015). However, with the introduction and growth of dry season agricultural activities in some areas in the Kano North Senatorial District through the efforts of River Basin Development Authorities (RBDA) and the Agricultural Development Project (ADP) as well as the prevalence of many dams and irrigation projects has brought hope and succor to the lives of rural-urban migrants (Ango, 2014). With rural irrigation projects as form of rural development progamme, the youth can be engaged in many agro-based activities, such as a farm labour, agro-business, transporting and processing agricultural produce and so on. With these home-based economic opportunities through agricultural rural development programmes, rural-urban migration in this area is apparently decreasing. Therefore, what is not clear is, does the programme lack adequate provisions that can support rural dwellers and discourage migration or is there no efficient strategy of creating public awareness on the effectiveness of such programmes in the reduction of rural based poverty.

Statement of the problem

Rural development is an interdisciplinary area of practice which aims at the improvement of the living conditions of rural dwellers. Rural development programmes are aimed at reducing poverty, providing jobs, improving income, imparting useful knowledge, attitude and skills and facilitating ultimate change among rural people. The phenomenon of rural-urban migration is an important feature of rural life that exposes rural youth to various hazards, inculcates dependency, breeds crimes and renders migrant families vulnerable to diseases, rape, hunger and insecurity. The introduction of irrigation rural development programmes in the Kano North Senatorial District is intended to improve the livelihood and wellbeing of rural communities as well as serve as a means of reducing the trend of rural-urban migration prevailing in the area. In some Local Government Areas of the Kano North Senatorial District, such as Bagwai, Bichi, Danbatta, Dawakin Tofa, Gwarzo, Gabasawa, Kabo, Kunchi, Makoda, Rimin-Gado, Shanono, Tofa and Tsanyawa, irrigation agricultural activities are taking place and youth in the area are being employed in irrigation sites as laborers, marketers, transporters, seed multipliers, and so on. This seems to prevent them from migrating out because they have employment and business opportunities at home. However, these programmes and strategies implemented over the years impact on the reduction of rural-urban migration. This study is, therefore, intended to find out the scope and challenges of irrigation rural development programmes in reducing rural-urban migration among irrigation farmers in the Kano North Senatorial District, Kano State.

Purpose of the study

The purpose of the study was to investigate the scope and challenges of irrigational rural development programmes in reducing rural-urban migration among irrigation farmers in Kano North Senatorial District, Kano State. Specifically, the study sought to investigate:

1. Determine the scope of irrigation rural development programmes in the Kano North Senatorial District, Kano State;
2. Examine the challenges facing irrigation farmers in the Kano North Senatorial District, Kano State.

Research Question

The following research questions guided this study:

1. What is the scope of irrigation rural development programmes in the Kano North Senatorial District, Kano State?
2. What are the challenges facing irrigation farmers in the Kano North Senatorial District, Kano State?

Methodology

Descriptive Survey research design was adopted for the study. It is a design in which a group of people or items are studied by collecting and analyzing data from only a few people or items considered to be representative of the entire group (Akuezuilo, 2002). The population for this study comprised the entire Irrigation Farmers from the 13 Local Governments areas in Kano North Senatorial District. According to available statistics there are six thousand two hundred and eighty seven 6,287 (KNARDA 2020 Records). The totals of 361 Irrigation Farmers were selected as respondents for the study out of the total of 6,287 that include irrigation farmers and executive members. The selection was based on the suggestions of the Krejcie and Morgan (2006) table for determining the sample size from a given population. A simple random sampling

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technique was adopted to select the relevant sample of 361 for the study. In applying the procedure, the researcher utilized two different sampling approaches to select the samples for the study in two phases; purposive sampling procedure and proportionate sampling procedure. The instruments of data collection were self developed instruments titled Questionnaire on irrigation farming and reduction of rural-urban migration (QIFRRUM) by the researcher. The instrument has two sections A and B. Section A has respondent's demographic information while section B had 10 items on the research questions, in the form of modified 4-point likert scale. The answering pattern provided multiple options for the respondents to choose, as Strongly Agreed (SA), Agree (A), Disagreed (D) and Strongly Disagreed (SD), the questionnaires were scored on the scale of SA= 4, A= 3, D= 2 and SD= 1. Therefore, the decision rule is based on the scale that a mean of 2.50 and above is considered as Agreed and a mean of below 2.50 as Disagreed was designed to elicit information from the respondents to indicate their level of agreement or disagreement with the items. The instrument was validated by experts. In order to determine the reliability of the instrument, the test-re-test method was used. The results obtained were correlated using the Pearson Product Moment Correlation (r) (PPMC) and the reliability co-efficient of 0.68 obtained showed the instrument is reliable for use in this study.

Presentation of Results

Research Question one: What is the scope of irrigation rural development programmes in the Kano North Senatorial District, of Kano State?

This research question was answered using frequency and percentages (%). Also, the average mean and standard deviation is presented in the following Table where N=361:

Table 1: Scope of Irrigation Rural Development Programmes

Variables	SA	A	D	SD	Mean	SD	Decision
	F (%)	F (%)	F (%)	F (%)			
It involves selling inputs such as agrochemical insecticide, pesticide, herbicide and seeds to farmers	56 (15.5)	194 (53.7)	111 (30.7)	- -	2.85	0.664	Agree
It involves marketing between companies and farmers	64 (17.7)	194 (53.7)	90 (24.9)	13 (3.6)	2.88	0.855	Agree
It involves cultivation of cereals like wheat, rice, maize and so on	107 (29.6)	175 (48.5)	46 (12.7)	33 (9.1)	2.65	0.817	Agree
It covers the cultivation of fruits like water melon, carrots, garden eggs and so on	94 (26.0)	181 (50.1)	42 (11.6)	44 (12.0)	2.90	0.926	Agree
It comprises the cultivation of vegetables and perishables	78 (21.6)	239 (66.2)	33 (9.1)	11 (3.0)	3.06	0.653	Agree
It involves poultry production	105 (29.1)	193 (53.5)	33 (9.1)	30 (8.3)	3.03	0.846	Agree
It covers livestock production	94 (26.0)	153 (42.4)	46 (12.7)	68 (18.8)	2.76	1.042	Agree
It involves marketing of agricultural produce	191 (52.9)	96 (26.6)	40 (11.1)	34 (9.4)	3.23	0.983	Agree
It involves transporting of product to markets	131 (36.3)	174 (48.2)	8 (2.2)	48 (13.3)	3.07	0.956	Agree
It involves providing labour to producers	87 (24.1)	193 (53.5)	50 (13.9)	31 (8.6)	2.93	0.849	Agree

Field Survey, 2025

The results presented in Table 1 indicate ten variables as the scope of irrigation rural development programmes in the Kano North Senatorial District, Kano State. All the ten (10) scopes presented to the respondents were responded to by the 361 samples. Thus, all the ten items were agreed as the scopes of irrigation rural development programmes in Kano North Senatorial District. The details about this result are as follows: An individual assessment of the scopes revealed that in Item1 the mean score is 2.85 (SD=0.664) which is even above the criterion mean (2.50). This indicates that the respondents

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agreed on irrigation rural development programme that involves selling inputs, such as agrochemical insecticide, pesticide, herbicide and seeds to farmers, with a frequency of 194 (53.7%), none of the respondents disagreed. In Item 2, the highest frequency of 194(53.87%) agreed that it involves marketing between companies and farmers with a mean score of 2.88 (SD=0.855). In Item 3, the highest frequency of 175(48.5%) agreed that it involves the cultivation of cereals like wheat, rice, maize and so on with a mean of 2.65 (SD=0.817). Similarly, in Item 4, the highest frequency of 181 (50.1%) agree that irrigation rural development programmes cover the cultivation of fruits like water melon, carrots, garden eggs and so on with a mean of 2.90 (SD=0.926). In Item 5, the highest frequency of 239 (66.2%) agreed that it comprises the cultivation of vegetables and perishables with a mean score of 3.06 (SD=0.653), poultry production with a mean of 3.03(SD=0.846). Furthermore, in Item 6, the highest frequency of 193 (53.5%) agreed that irrigation rural development programmes involve poultry production with a mean of 3.03(SD=0.846). While in Item 7, the highest frequency of 153 (42.4%) agreed that it covers livestock production with a mean of 2.76(SD=1.042). In Item 8, the highest frequency of 191 (52.9%) strongly agreed on marketing agricultural produce with a mean of 3.23(SD=0.983). In Item 9, the highest frequency of 174 (48.2%) agreed on transporting products to markets with a mean of 3.07(SD=0.956) and in Item 10, the highest frequency of 193 (53.5%) agreed on providing labour to producers with a mean score of 2.93 (SD=0.849). Overall, all of the participants agreed that all the ten (10) statements in the items were the scope of irrigation rural development programmes because all the mean scores were above the decision rule of 2.5.

Research Question two: What are the challenges facing irrigation farmer's in the Kano North Senatorial District, Kano State?

This research question was answered using frequency and percentages (%). Also, the average mean and standard deviation is presented in the following Table where N=361:

Table 2: Challenges Facing Irrigation Farmers

Variables	SA	A	D	SD	Mean	SD	Decision
	F (%)	F (%)	F (%)	F (%)			
Inadequacy of fertilizers and water pump machines	104 (28.8%)	243 (67.3%)	14 (3.9%)	- -	3.25	0.515	Agree
Access to loan scheme to irrigation farmers	120 (33.2%)	223 (61.8%)	18 (5%)	- -	3.28	0.551	Agree
Inadequate technical advice to irrigation farmers	108 (29.9%)	245 (67.9%)	8 (2.2%)	- -	3.28	0.495	Agree
Inefficient extension services	129 (35.7%)	202 (56%)	30 (8.3%)	- -	3.27	0.605	Agree
Communication and adequate capacity building	153 (42.4%)	193 (53.5%)	13 (3.6%)	2 (0.6%)	3.38	0.584	Agree
Startup capital and irregular fuel supply	147 (40.7%)	208 (57.6%)	- -	6 (1.7%)	3.37	0.579	Agree
Poor quality of local manufacturing and frequent breakdown	135 (37.4%)	187 (51.8%)	39 (10.8%)	- -	3.27	0.642	Agree
Poor direction and clear strategy on irrigation farming	136 (37.7%)	175 (48.5%)	40 (11.1%)	10 (2.8%)	3.21	0.745	Agree
Poor effective monitoring of irrigation activities	183 (50.7%)	178 (49.3%)	- -	- -	3.51	0.501	Agree
High costs of inputs	146 (40.4%)	206 (57.1%)	9 (2.5%)	- -	3.38	0.535	Agree

Field Survey, 2025

The results presented in Table 2 indicate ten variables as the challenges facing irrigation farmers in the Kano North Senatorial District, Kano State. All the ten (10) challenges presented to the respondents were responded to by the 361

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samples. Thus, all the ten items were agreed as the challenges facing the irrigation farmers. An individual assessment of the challenges indicated that in Item 1, the highest frequency of 243 (67.3%) agree that inadequacy of fertilizers and water pump machines is one of the challenges with a mean of 3.25 (SD=0.515). In Item 2, the highest frequency of 223 (61.8%) agreed about the inability to access loan schemes to irrigation farmers with a mean of 3.28 (SD=0.551). In Item 3, the highest frequency of 245(67.9%) agreed on inadequate technical advice to irrigation farmers with a mean of 3.28 (SD=0.495). In Item 4, the highest frequency of 202 (56%) agreed on inefficient extension services with a mean of 3.27 (SD=0.605). In Item 5, the highest frequency of 193 (53.5%) agreed on communication and adequate capacity building with a mean of 3.38 (SD=0.584). In Item 6, the highest frequency of 208 (57.6%) agreed on startup capital and irregular fuel supply with a mean of 3.37 (SD=0.579). In Item 7, the highest frequency of 187 (51.8%) agreed on poor quality of local manufacturing and frequent breakdown with a mean of 3.27 (SD=0.642). In Item 8, the highest frequency of 175 (48.5%) agreed on poor direction and clear strategy on irrigation farming with a mean of 3.21 (SD=0.745). In Item 9, the highest frequency of 183 (50.7%) strongly agreed on poor effective monitoring of irrigation activities with a mean of 3.51(SD=0.501). Lastly, in Item 10, the highest frequency of 206 (57.1%) agreed on high costs of inputs with a mean of 3.38 (SD=0.535). Overall, the participants agreed that all the ten (10) statements were the challenges facing irrigation farmers in the Kano North Senatorial District because all the mean score were above the decision rule of 2.5.

Discussion of Findings

The first finding of the study revealed that the scope of irrigation rural development programmes in the Kano North Senatorial District, Kano State includes cultivation of cereals, fruits, vegetables and perishables, poultry production, livestock production, marketing agricultural produce, transporting products to markets and providing labour, selling inputs to farmers and marketing agricultural produce. This result is consistent with the Focus Group Discussion (FGD) session as respondents from Kunchi and Makoda irrigation farmers associations opined that the major scope of irrigation are the above farming. This clearly demonstrates that they had trained many youths, both male and female, in irrigation farming systems. This had helped them to improve their socio-economic condition, thereby providing a means of their livelihood generally and also in the areas of study to determine rural-urban migration. Also, this result complements the findings from the Focus Group Discussion held with other irrigation farmers associations from Dawkin-Tofa, Gwarzo and Bagwai Local Government Areas. These indicate that rural-urban migration is not usually encouraged by their people, but irrigation activities are predominantly engaged by their people, both male and female, respectively. These findings collaborate Oyeniyi (2013) and Ugalahi (2016) whose findings revealed that farmers, the cultivation of rice, maize, fruits, carrots, garden eggs, vegetables and perishables, poultry production, livestock production, marketing agricultural produce, transporting products to markets and providing labour to producers. The above findings also were complemented by the responses respondents of the Focus Group Discussion (FGD) session held with various selected irrigation rural development leaders in the study areas.

The second finding of this study indicates that, the challenges facing irrigation farmers in the Kano North Senatorial District, Kano State and shows that the inadequacy of fertilizers and water pump machines, in-ability to access loan scheme to irrigation farmers, inadequate technical advice to irrigation farmers, inefficient extension services, communication and adequate capacity building, startup capital and irregular fuel supply, poor quality of local manufacturing and frequent breakdown, poor direction and clear strategy on irrigation farming, poor effective monitoring of irrigation activities and high costs of inputs were the challenges. The implication of this is that through appropriate rural development programme by government, rural-urban migration can be curtailed, thereby making rural inhabitants economically self-reliant through irrigation rural development infrastructures. The findings also revealed that Government needs to do more to stem rural-urban migration. Government must intensify rural development in Nigeria as expected by majority of the rural populace. People in rural areas have no need to migrate to urban centers if basic social amenities and other variables to make them comfortable are provided. This finding is consistent with that of Oravee (2015), who reported that the challenges of inadequate funding of the river basins could be traced back to 1989, which was instrumental to discontinuing of direct involvement in farming activities by some of the River Basins and Rural Development Authorities consequently leading to the in-effectiveness of the scheme. The attitudes and interests of the participating farmers have a larger role to play when it comes to Nigeria's irrigation farming. The government and its agencies in charge of irrigation systems need to be proactive in discharging their duties and correspondingly provide a platform to encourage and sensitize farmers on the need

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to engage in irrigation farming rather than on only the rain-fed. In addition, farmers are not interested in the operation and maintenance of the large-scale irrigation facilities. Furthermore, the irrigation farmers leaders revealed that the major constraints in utilizing irrigation potential through large-scale schemes include: Unwieldy functions of the RBDAs resulting in dilution of their functions relating to efficient management of irrigation projects, Scarcity of experienced, dedicated, motivated and technically sound manpower ready to implement the project on a sustainable basis, results in sub-optimal managed projects, Lack of direction and clear strategy on the development of irrigation by the government, Shortage, and at times the delayed release of finances by the government, Unwillingness of small farmers (less-powerfulness) to participate in the scheme as they continue to doubt the reliability and timeliness of irrigation water to them at their tail-end plots, lack of enough fertilizers, engines and agro-chemicals, Inadequate technical advice to irrigation farmers, lack of direction and clear strategy on irrigation farming, canal erosion and land degradation in the field, lack of adequate startup capital and irregular fuel supply, lack of effective monitoring and improper maintenance. These farmers are expected to constitute the bulk of the beneficiaries. Similarly, Adekunle (2015) found out that poor knowledge of irrigation techniques among farmers was one of the factors affecting their participation enlarge-scale irrigation scheme. Those that manage to participate are not equipped with the requisite knowledge for the operations and maintenance of facilities. This problem is one of the current challenges being faced by the large-scale irrigation scheme in Nigeria. Population in cities and sub-urban areas in developing countries, including Nigeria, is expected to increase from 1.9 billion in 2000 to 3.9 billion in 2030. This is principally attributed to rural to urban migration, which is consequent upon dichotomous planning and development many developing countries adopted. This subsequently results in the rural deprived and the urban endowed that translates into improved amenities and economic opportunities in urban centres than rural areas (Abdullahi, Shaibu-Imodagbe, Mohammed, Sa'id & Idris, 2015).

Conclusion

The study revealed the scope of irrigation rural development programmes in the Kano North Senatorial District, Kano State are cultivation of cereals, fruits, vegetables and perishables, poultry production, livestock production, marketing of agricultural produce, transporting products to markets, providing labour and selling inputs to farmers. Therefore, the results also from the data analyses presented revealed that irrigation rural development programmes involve selling inputs, such as agrochemical insecticide, pesticide, herbicide and seeds to farmers, marketing between companies and farmers, cultivation of cereals like wheat, rice, maize, of fruits like water melon, carrots, garden eggs, and of vegetables and perishables, poultry production, livestock production, marketing agricultural produce, transporting products to markets and providing labour to producers in Kano North Senatorial District. Similarly, the findings on the challenges revealed that, inadequacy of fertilizers and water pump machines, inability to access loan schemes, inadequate technical advice, inefficient extension services, communication and adequate capacity building and high cost of inputs. Thus, it can be concluded that despite the above challenges, irrigational rural development programmes enhance communities members to improve their skills, socio-economic status and employment opportunities thereby reduction rural-urban migration in order to stay in their communities.

Recommendation

Based on the findings of the study and discussion above, the following recommendations are made for improving.

i. Government should provide agricultural inputs and farming technologies to irrigation farmers to improve the production level. Good roads should be constructed for rural areas and credit facilities provided for irrigation farmers to improve their agricultural production, which will lead to the improvement of marketing between companies and farmers and their standard of living.
ii. Kano State Government should intensify efforts in the provision of adequate fertilizers and water pump machines, access to loan schemes to irrigation farmers, adequate technical advice and the provision of efficient extension services, communication and adequate capacity building in order to determine the challenges facing irrigation farmers in the Kano North Senatorial District, Kano State Nigeria.

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Influence of School Plant Planning on Job Performance among Public Secondary School Teachers in Delta Central Senatorial District of Delta State, Nigeria

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Abstract

This study was carried out to examine the influence of school plant planning on teachers' job performance in public secondary schools in Delta Central Senatorial District of Delta State, Nigeria. Three research questions were raised and three research hypotheses formulated to guide the study including the testing of hypothesis at 0.05 level of significance. Two theories were adopted in thisstudy, namely, environmental theory by John Locke in 1917 and theory of Observational Learning propounded by Albert Bandura in 1964. Twenty (20) empirical studies were reviewed. A descriptive survey research design was used. The simple random sampling procedure was adopted in determining the sample size. The population of this study is 1,554 which consist of 75 principals and 1,479 teachers from all the public secondary schools in Delta CentralSenatorial District of Delta State, Nigeria. While the sampled size stood at 157 representing10% of the total population of 1,554 principals and teachers in Public Secondary Schools in Delta Central Senatorial District of Delta State, Nigeria. Questionnaire on Influence of School Plant Planning on Teachers' Job Performance (QISPPTJP) was used for data collection. Data were analyzed using descriptive statistics. Hypotheses were tested using chi-square. The findings revealed that school plant planning has significant influence on teachers' job performance and maintenance of school plant has significance on teachers' job performance in public secondary schools in Delta Central Senatorial District in Delta State, Nigeria. Based on the findings of this study it was recommended that Delta State Ministry of Education should engage experts to handle school plant planning as well as the maintenance of school plant. The study also recommended that adequate fund should be provided by the Delta State Government through the Ministry of Education to public secondary Schools for the maintenance of school plant to enhance teachers' job performance.

KEYWORDS: School plant planning, job performance & teachers

Introduction

Education is seen as the backbone of development in any nation. It improves the quality of life of a society through refinement of its potentials. Education further enhances the application of man's achievement towards improvement of his environment. In every known great nation, therefore, national development was preceded and accomplished by educational advancement. Today, there is an increasing faith in the casual relationship between education and economic development especially in the developing countries likeNigeria. Education has been seen as a vehicle for economic, social-cultural and political development of nations and individuals (Obayan, 2014). Education is a social process in which one achieves societal competence and individual growth. Education is the art of learning about one's self and one's environment for the purpose of self-development (Oyedeji, 2013). This research work is limited to public secondary education. Secondary education does not only occupy an important place in the Nigerian education system, it also serves as a link between the primary and tertiary levels. The Federal Republic of Nigeria (2013) defined secondary education as the education the learner receives after primary education and before the tertiary stage. Secondary educationin Nigerian schools is for a period of 3 years and it is for students who had successfully completed the Basic 9 education programme. The secondary school system is however a very crucial level of educational system. Other things being equal, as crucial as secondary education is, its goals will not be achieved if there is faulty school plant in place (Odunfowokan, 2011). It can therefore be said that the realisation of the secondary education goals is attainable through appropriate school plant planning. Corroborating this, Oyesola (2007) stated that the main objective of school plant planning is to satisfy the goals of secondary education in particular and other level of education in general which have been predetermined by educational planner. He explained that better planned school plants will enhance better school programmes and the community needs

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by providing a place for psychological and physical safety for teachers and students, enhancing the good, quality and quantity of instruction.

School plant planning is an integral part of the overall educational planning. According to Ajayi and Yusuf (2010), school plant planning is a process in which a suitable site is selected and instructional space, administrative space, recreational space, circulation space, and spaces of convenience are designed to facilitate the teaching and learning process in the school system. As a result, school plant planning is often considered an essential aspect of educational planning (Oluchukwu, 2000). It therefore behooves that school plant is appropriately planned to facilitate the effectiveness of secondary school system so as to bring about the achievement of secondary education goals. School plant planning such as school site planning, instructional space planning, administrative space planning, recreational space planning, space of convenience planning, circulation space planning and maintenance planning are essential in enhancing job performance process in the school system (Odunfowokan, 2011). The extent to which, these spaces may enhance better teaching and learning depends on their location, structure and facilities within the school premises. It is likely that well planned school plants in terms of location, structure and facilities will facilitate effective teachers' job performance and enhance better learning outcomes of the students. Odupurokan (2011) states that a well-planned school plant will gear up expected outcomes of education that will facilitate good social, political and economic emancipation through effective teaching and academic performance of students. Therefore, it can be said that the school plant is an essential aspect of educational planning because unless schools are well sited, buildings adequately constructed and equipment adequately provided much teaching may not take place. Corroborating this, Mark (2002) and Ajayi (2007) maintained that high levels of teachers' job performance may not be guaranteed where instructional space such as classrooms libraries, technical workshop and laboratories are lacking. However, in spite of the importance accorded school plant planning in realizing educational goals, it has not been given the adequate attention it deserves especially in developing countries like Nigeria. According to Amanchukwu and Ololube (2015), one of the strongest problems with the Nigerian educational system is the inappropriate school plant planning. It is worrisome that majority of the schools in our cities and towns especially in studied area are not properly planned in terms of instructional, recreational and maintenance school plants. For instance, students, especially in government-owned secondary schools, sit on floors to receive instruction. They receive instruction in classrooms which are similar to death traps due to their poor construction. Most of these schools are ignorantly sited near market places, highways, rail line, industries, airports, very close to main roads etc. and these prevent teachers from concentrating on the lesson because of the distractions from noise within the environment as well as preventing students from paying rapt attention to what is being taught in class by the teacher. Most schools are sited in areas that do not have capacity for further expansion in the nearest future (Agi, 2013).

The quality and standard of school depend largely on the provision, adequacy of school plant like the school buildings, classrooms, libraries, laboratories football pitch, offices, etc (Akinsolu, 2014). School plant is very useful in bringing about effective and purposeful teaching and learning. According to Emetarom (2014), school plant are the physical and spatial enablers of teaching and learning which will increase the production of results and serve as pillars of support for effective teaching. The success of any system of education depends to a large extent on the teachers, their quality and their devotion to duty and their effectiveness on the job. It is as a result of this central position of the teachers that it is often said that no educational system can rise above the quality of its teachers (Rusillo and Arias, 2014). The teacher is a critical element in the teaching-learning situation. What he does or does not do affects learning in a proud way. Research has shown that the quality of teaching makes a considerable difference in students' learning and performance. This implies that the teacher is the key factor in whether a child learns well or not. The teacher is the one that translates educational philosophy and objective into knowledge and skill and transfers them to students in the classroom. The teacher commands and emits the image of one who improves knowledge and the physicalconditions of the classroom through orderliness, discipline and control. He makes diagnosis of student's feelings and attitudes inferred by their behaviour and response in the classroom environment (Farland, 2016). The teacher is basically saddled with the responsibility of transferring knowledge, skills, attitudes and techniques to his studnts. The teacher makes an attempt to help people to acquire some skills, attitudes, knowledge, ideas and applications. Thus, the teacher's task is to influence or create desirable changes in behaviour in his or her own students. The teacher often guides the students through a series of planned activities so that his studentsmay acquire the highest learning possible experiences. In the school system, a teacher's job performance could

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be described as the dutiesperformed by a teacher at any given time in the school geared towards achieving both thedaily school and classroom objectives and the entire set goals and objectives of education. The performance could be described as low, moderate, high, etc, depending onthe extent of his commitment to work in order to achieve set objectives and goals(Adeyemi, 2014). This means that the variables of job performance such as effective teaching, effective use of scheme of work, lesson note preparation, effective supervision, monitoring of students' work and disciplinary ability are virtues which teachers should uphold effectively in the school system. According to Nwogwu (2017), the planned activities of the teacher involves classroom instructions, preparation of lesson notes and lesson plan, evaluation of students performance, discipline of the children where necessary, etc, while the students respond positively and contribute meaningfully to the instructions received through classroom participation of answering questions and asking questions.

The school plant in most secondary schools in Nigeria has not been sufficient enough toenhance teachers' job performance. In some cases, teachers deliver their lessons while standing, seating on tables, and even sitting on the windows due to small sized classrooms. Also, many of the laboratories, libraries, and play grounds cannot accommodate a reasonable number of students (Mutiu, 2019). This negatively affects the teacher. In fact, Ahmed (2016) showed that in most of the nation's secondary schools, teaching and learning take place under a most uncomfortable environment, lacking basic materials. Physical conditions refer to those things that must be available in the work place for effective work to takeplace. In the context of the school system, they are those things that enable the teacher and students to be able to carry out the teaching/learning process effectively and contribute to the achievement of the school goals and objectives without fatigue and distraction. As opined by Felix (2016), a good school organization must have appropriate physical conditions (aesthetic beauty, availability of instructional materials, location) necessary for effective teaching/learning. There should be maximum presence of school plant such as good building constructions, sufficient windows and doors to cool the heat during hot season. All these improve the teachers' job performance and consequently students' performance. However, in most public secondary schools in Delta Central Senatorial District of Delta State, there appear to be shortage of school plant which in turn hinders teachers' job performance. For instance, most secondary schools in Delta Central Senatorial District of Delta State have insufficient classroom that can accommodate the large number of students who want to attend secondary education. The libraries, football pitch, and even school hall cannot contain a reasonable number of students. It becomes challenging for the teacher to move around during lessons and effectively manage his students. Ijaduola (2017) cautioned that with poor availability of school plants, there are usually mental fatigue, truancy, frustration, discomfort, and poor health; all that consequently reduces teachers' job performance.

Many scholars, researchers, administrators and educational planners have confirmed that school plant in Nigerian public secondary schools are inadequate and the few available ones are being over utilized due to poor funding. Ikoya and Onoyase (2015) reported that only 48% of public secondary schools across the country have school infrastructures in adequate quality and quantity. Ajayi (2015) reported that some of the Nigerian public secondary schools are dilapidated due to inadequate funding while most of the schools are living in their past glories. Such situation hinders effective teaching and making the process rigorous and uninteresting to teachers. This seems to be the situation in most public secondary schools in Delta Central Senatorial District of Delta State, where most of the public schools experience poor adequate funding fromstate government through its secondary education board in charge of the various secondary schools, which then limits the availability of these facilities necessary for effective teaching to take place. In fact, proper school plant planning and adequate provision of school plant has a strong influence on teachers' job performance. Researchers like Wilcockson (2016), Ajayi (2013) and Owoeye (2017) have strongly identified the importance of school plant in teaching while the inadequacy, deterioration and lack of maintenance of these facilities will spell doom for the teachers and students in the teaching and learning activities. To this end, the management of various public secondary schools has a lot to do to ensure proper management and maintenance of equipment and facilities in the school which will in turn enhance teachers' job performance (Lawal, 2014). However, the reality in most public secondary schools in Delta Central Senatorial District of Delta State seems to be ugly in that, administrators appear to spend much time on instructional planning, curriculum development, personnel development and community relations claiming that the management and maintenance of school facilities is the sole preserve of the government.This results to cases of broken chairs, broken tables, and roof leakages which are observed in the raining season, etc, as a result of poor maintenance. The availability and maintenance of school plant will enhance or improve teachers' job performance. It is against this background that the

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researcher is examining influence of school plant planning on teachers' job performance in public secondary schools in Delta Central Senatorial District of Delta State, Nigeria.

Statement of the Problem

There have been public concerns in recent times by parents and other stakeholders in education about the poor performance of teachers in public Secondary Schools in Delta Central Senatorial District of Delta State in particular and Nigeria in general. The poor performance of teachers has been attributed to poor performance of students in both internal and external examinations. That most times, teachers exhibit high level of unprofessional conduct in the school. Many of them hawk wares during official hours, some absent themselves from school without permission, even when they are in school do not attend classes/lessons. Others abandon their lessons and engage in taking alcohol during school hours and show general lack of commitment to their jobs. Again, there have been growing concerns about poor school plant planning in public Secondary Schools in Delta Central Senatorial District of Delta State. Most of the schools in the studied area are sited in poor or unsuitable locations, poor instructional, administrative, circulation, recreational and convenience spaces which cumulated into inadequate school plant such as school buildings-classrooms, assembly halls, laboratories, workshops, libraries etc with poor lighting, noise, inconsistent temperatures due to ineffective ventilation. Also, there is poor school plant maintenance which has resulted in dilapidated buildings with leaking roofs, broken windows, blown off roofs, cracked and decaying walls, sagging roofs, and many more. The poor performance of teachers could be attributed to poor school plant panning. It is in view of the above premise that prompted the researcher to carry out a study to determine whether school plant planning influences teachers' job performance in public secondary schools in Delta Central Senatorial District of Delta State, Nigeria.

Objectives of the Study

The objective of the study is to determine the extent to which school plant planning influence teachers' job performance in public secondary schools in Delta Central Senatorial Districtof Delta State, Nigeria. Specifically, the study intends to:

1. Determine the extent to which school plant planning in terms of instructional space influence teachers' job performance in public secondary schools in Delta Central Senatorial Districtof Delta State, Nigeria.
2. Determine the extent to which school plant planning in terms of recreational space influence teachers' job performance in public secondary schools in Delta Central Senatorial Districtof Delta State, Nigeria.
3. Determine the extent to which school plant maintenance planning influence teachers' job performance in public secondary schools in Delta Central Senatorial Districtof Delta State, Nigeria.

Research Questions

The following research questions were formulated to guide the study:

1. To what extent does school plant planning in terms of instructional space planning influence teachers' job performance in public secondary schools in Delta Central Senatorial District of Delta State, Nigeria?
2. To what extent does school plant planning in terms of the recreational space planning influence teachers' job performance in public secondary schools in Delta Central Senatorial District of Delta State, Nigeria?
3. To what extent does school plant maintenance planning influence teachers' job performance in public secondary schools in Delta Central Senatorial District of Delta State, Nigeria?

Research Hypotheses

H_{O1}: There is no significant influence of instructional space planning on teachers' job performance in public secondary schools in Delta Central Senatorial District of Delta State, Nigeria

H_{O2}: There is no significant influence of recreational space planning on teachers' job performance in public secondary schools in Delta Central Senatorial District of Delta State, Nigeria

H_{O3}: There is no significant influence of maintenance of school plant on teachers' job performance in public secondary schools in Delta Central Senatorial District of Delta State, Nigeria.

Methodology

The study made use of descriptive survey research design. Specifically, the study used cross-sectional survey because it requires that data are collected at a particular time, from a large sample for the purpose of describing a population represented by thesample at that particular time.

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Population of the Study

The population of this study is 1, 554 which consist of 75 principals and 1,479 teachers from all the public secondary in Delta Central Senatorial District of Delta State (Delta State Ministry of Education, 2021). The common characteristic of the population is that all of them arepublic school principals and teachers. See table below for details of the distribution of populationof the study:

Table 1: Distribution of Population of the study by Local Government and Schools, Principals and teachers

Local Government	No. ofSchools	No. of Principals	No. ofTeachers	Total
Ethiope East	8	8	187	195
Ethiope West	9	9	175	184
Sapele	8	8	179	187
Okpe	10	10	184	194
Ughelli North	9	9	185	194
Ughelli SouthUdu	12	12	193	105
Uvwie	10	10	185	195
	9	9	191	100
Total	**75**	**75**	**1479**	**1,554**

Source: Delta State Ministry of Education, 2026

The sample of this study consists of selected public secondary in Delta Central Senatorial District of Delta State from a population of 1, 554 which consist of 75 principals and 1,479 teachers. The Simple Random Sampling procedure of 10% randomization was used by the researcher to collect data for the research. Hence, the sample size is determined as follows:

Table 2: Sample frame of study by Local Government and Schools, Principals and teachers

Local Government	Sample of Schools	Sample of Principals	Sample of Teachers	Total
Ethiope Ease	1	1	19	20
Ethiope West	1	1	18	19
Sapele	1	1	18	19
Okpe	1	1	18	19
Ughelli NorthUghelli SouthUdu	1	1	19	20
Uvwie	1	1	19	20
	1	1	19	20
	1	1	19	20
Total	**8**	**8**	**149**	**157**

The sample size is therefore 157 which consist of 8 principals and 149 teachers representing 10%of the total population of 1, 554 which consist of 75 principals and 1,479 teachers in Delta Central Senatorial District of Delta State. Gleen (2013) was of the opinion that in surveyresearch, a sample size of 10% is considered minimum. The level of significance indicates the confidence the researcher has on the sample that the subjects drawn, has all the characteristics of the population. The questionnaire was designed by the researcher and it is called Questionnaire on Influence of School Plant Planning on Teachers' Job Performance (QISPPTJP).

Summary of Major Findings

Based on the results of the analysis of the three research questions and testing of the three hypotheses postulated for the study, the following constitute the summary of the major findings:

1. There is significant influence of instructional space school plant planning on teachers' job performance in public secondary schoolsin Delta Central Senatorial District of Delta State, Nigeria.
2. That there is significant influence of recreational space school plant planning on teachers' job performance inpublic secondary schools in Delta Central Senatorial District of Delta State, Nigeria.
3. That there is also a significant influence of school plant maintenance planning on teachers' job performance in public secondary schools in Delta Central Senatorial District of Delta State, Nigeria.

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Discussion of Findings

Based on the results of the analysis of the three research questions and testing of the three hypotheses postulated for the study, the findings are discussed thus:

The first finding of this study revealed that there exists a significant influence of instructional space school plant planning on teachers' job performance in public secondary schools in Delta Central Senatorial District of Delta State, Nigeria. This findingis is in line with Martin (2008) who admitted that, the school plant planning with number of buildings, sufficient classrooms, spacious enough to avoid over-crowding in the classrooms gives teachers the comfort to teach their lessons and go round the classroom to check individual student class work. This was corroborated by Adegboyega, (2018) who posited that, well planned school buildings with well-ventilated and adequate light provide a good teaching and learning environment for both the teacher and student. Ololube, (2016) also in agreement with the finding started that, a well-planned school with facilities such as library, laboratory, class computer laboratory, and office accommodation for teachers have a great impact on the teachers' effectiveness and students' performance in secondary schools. The above finding was also in accordance with the views of Owoeye and Yara's (2011) whose study revealed a significant relationship between the job performance of teachers in secondary schools and availability of library facilities, availability of textbooks, and availability of laboratory facilities. Their study revealed that facilities were potent to teachers' job performance and high academic achievement of students.

The second finding of this study revealed that recreational space school plant planning influence teachers' job performance in public secondary schools in Delta Central Senatorial District of Delta State, Nigeria. This finding is in agreement with Fakomogbon (2009) who noted that recreational facilities are important tools in the school that can strengthen the emotional health and rejuvenate the teacher to enhance teachers' job performance. He stated that, by engaging in recreational actives it reduces the feelings of depression and anxiety in teachers thereby preparing them mentally for job performance. And that those teachers who are mentally alert goes with excitement and teach with vigor which gives students better understanding. Corroborating on the views of Fakomogbon, Owoeye (2010) stated that physical activities and sporting have health benefits from moderate participation, improved strength and endurance, healthier bones and muscles, weight control, reduced anxiety and increased self-esteem, and, often, improved blood pressure and cholesterol levels which gives teachers renewed energy for better job performance. Ezeanichinedu (2012), also supported the finding of this study when he stated that the use of recreational facilities encourages social interaction among teachers, improve concentration, increase personal confidence and self-awareness. These according to him are motivating factors for teachers' job performance. Ikoya and Onoyase (2015) reported in their investigation of teacher's job performance through results of public secondary schools in WAEC 2011 – 2015 in Cross River State find out that schools with adequate recreational facilities and whose teachers participate actively in sporting activities perform better than without adequate recreational facilities.

The third finding of the study indicated that maintenance of school plant influences teachers' job performance in public secondary schools in Delta Central Senatorial District of Delta State, Nigeria. This finding corroborates with Anzaku (2011) which stated that, the marker - board most time is the available visual material in the class that teachers use to teach students. The effective management of this classroom marker – board enhances teachers' teaching skills of writing clearly to be legible for students especially those who sit at the back which demonstrate teachers' effectiveness in their job performance. This fact is attested by Azuibuike (2012) who opined that, ''Instructors with trained manpower requirement can effectively use visual materials like the marker - board in the teaching and process for learning tobe achieved by all in a large class.'' However, most public secondary schools in Delta South Senatorial District, Delta state, Nigeria, teachers come to the classroom with poor managerial manpower required in the effective use of the available visual material in the classroom – marker- board; by using a writing material that the colour is not bright enough which will not make a large class to see and learn.

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Conclusion

The study concluded that there should be adequate school plant planning, adequate school plant funding and maintenance of school plant which will impact significantly or influence to a high extent teachers' job performance therefore, should not be treated with levity.

Recommendations

Based on the findings of this study, the following recommendations were made;

i. Delta state government should ensure that it takes responsibility through the state ministry of education to handle and coordinate school plant planning and ensure adequate provision of school plant in public secondary schools in Delta state, which will go a long way to enhance teachers' job performance
ii. Delta state government should increase budgetary allocation to education through ministry of education to adequately fund school plant planning for adequate provision and maintenance of school plant in secondary schools in the state.

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Impact of Instructional Materials on Achievement in Physics Concept among Secondary School Students in APA Local Government Area of Benue State, Nigeria,

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Abstract

This paper compared the impact of instructional materials on achievement in physics concept among secondary students in Apa LGA, Benue State. The study also compared the impact of instructional materials on male and female students in Physics. A quasi-experimental design was employed to compare learning outcomes between an experimental group and a control group. The study population consisted of 4,255 SS II students offering Physics in 15 public secondary schools, from which 165 students were randomly selected as participants. Instruction for the experimental group incorporated appropriate instructional materials, whereas the control group received instruction through traditional teaching methods without instructional support. Data were gathered using a Physics Achievement Test developed from previous West African Examinations Council examination items. The instrument was validated by specialists in Science Education and produced a reliability coefficient of 0.88. Statistical analysis of pretest and posttest scores was carried out using independent-samples t-test at the 0.05 level of significance. The findings showed that students taught with instructional materials demonstrated significantly higher academic achievement than those taught without them. The results further revealed that gender did not significantly influence the achievement of students exposed to instructional materials. The study concluded that the integration of instructional materials plays a critical role in improving students' understanding and achievement in Physics, regardless of gender. It was therefore recommended that Physics teachers consistently employ instructional materials to enhance classroom learning outcomes.

Keywords: Instructional materials; physics education; academic achievement; secondary schools

Introduction

Science represents a systematically organized body of knowledge, developed through careful observation, experimentation, and logical reasoning. It serves as a tool for solving problems, explaining natural phenomena, and improving human life. Ogunmola (2008) described science as a dynamic human activity that generates principles—laws, theories, and hypotheses—that explain events and enable predictions. Recognizing science's vital role in national development, the Federal Government of Nigeria, through the Federal Ministry of Education, has integrated science education into the national school curriculum. Science education extends beyond learning facts to include methods and strategies for effectively teaching and understanding scientific concepts. It also prepares students for careers in science, technology, engineering, and mathematics (STEM), fields that provide substantial professional opportunities (Eze, 2020). According to Okeke (2007), science education integrates content knowledge with effective instructional practices across subjects like Physics, Chemistry, and Biology. At the Senior Secondary School (SSS) level, Physics is a key subject that introduces learners to concepts of matter, energy, motion, and forces. The Nigerian Educational Research and Development Council (NERDC) emphasizes that the Physics curriculum aims to develop scientific skills, critical thinking, technological awareness, and readiness for further studies and STEM careers (Isola, 2010). Despite Physics' importance, students' performance in the subject is generally low in many Nigerian secondary schools. Factors contributing to this include the abstract nature of Physics concepts, ineffective teaching methods, insufficient laboratory facilities, and limited use of instructional materials (Yusuf, 2012). Concepts such as mechanics, electricity, and waves are particularly difficult when instruction relies solely on verbal explanations without supporting resources.

Instructional materials play a crucial role in Physics education by enhancing understanding, sustaining interest, and simplifying complex ideas. They include experiments, models, charts, and technological tools that convert theory into practical learning experiences. Research underscores their impact: Abubakar (2020) noted that instructional materials

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improve comprehension and examination performance, while Olaide (1990) emphasized that their effectiveness depends on teachers' competence. Oguche (2025) highlighted that visual and audio-visual aids promote active learning and facilitate teaching objectives. Kay (2008) also reported that instructional materials encourage learner-centered instruction, active participation, and engagement. Academic achievement, measured through examinations and tests, reflects how well learners attain instructional objectives (Daniel, 2021; Jafar, 2025). Studies indicate that effective use of instructional materials enhances motivation, reinforces retention, strengthens problem-solving skills, and improves Physics performance. Active engagement with these resources promotes deeper conceptual understanding and long-term knowledge retention. Nevertheless, many Physics students in Apa Local Government Area of Benue State continue to underperform, largely due to reliance on traditional lecture methods and minimal use of instructional materials. This approach hinders comprehension, diminishes interest, and lowers performance in both internal and external assessments. Considering the critical role of Physics in scientific literacy and technological advancement, this situation is a major concern for educators, parents, and policymakers. This study, therefore, examines the effect of instructional materials on the academic achievement of Physics students in Apa Local Government Area of Benue State. Its goal is to determine how effective utilization of instructional resources can improve understanding, retention, and overall performance in Physics.

Statement of the Research Problem

A major challenge confronting secondary education in Nigeria is the persistent low academic achievement of students in the sciences, particularly in Physics. In Apa Local Government Area of Benue State, many students continue to perform poorly in Physics, as reflected in both internal and external examinations. This trend undermines the development of scientific literacy and limits students' preparedness for careers in engineering, technology, and other science-related fields. Research suggests that inadequate use of instructional materials significantly contributes to poor student performance in Physics. Many classrooms lack sufficient teaching aids, laboratory equipment, and visual or practical resources to support effective learning. Additionally, some teachers rely heavily on traditional lecture methods, where students remain passive recipients of information, resulting in limited practical engagement and poor understanding of abstract concepts (Abdullahi, 2010; Atadoga & Lakpini, 2013). Large class sizes, limited time for experiments, and insufficient improvisation of instructional materials further exacerbate the problem. Consequently, students have minimal exposure to hands-on learning experiences that are essential for comprehension, retention, and problem-solving in Physics. Despite the recognized importance of instructional materials in enhancing academic achievement, their utilization in Physics classrooms in Apa remains inadequate. This study, therefore, seeks to investigate the effect of instructional materials on the academic achievement of Physics students in Apa Local Government Area, Benue State, with the aim of determining whether the use of such resources can improve understanding, retention, and overall performance in the subject.

Objectives of the Study

The study was guided by the following objectives:

1. To investigate the effect of using instructional materials on the academic achievement of Physics students in Apa Local Government Area, Benue State.
2. To determine whether there is a gender-related difference in academic achievement among students exposed to instructional materials in Physics.

Research Questions

The study sought to answer the following questions:

1. What is the mean achievement scores of students exposed to physics concept using instructional materials and those taught without instructional materials in Apa local government Area, Benue State?
2. What is the mean achievement scores of male and female students exposed to physics concept using instructional materials and those taught without instructional materials in Apa local government Area, Benue State?

Hypotheses

The following null hypotheses were formulated for testing at the 0.05 level of significance:

H_{o1}: There is no significant difference between mean achievement scores of students exposed to physics concepts using instructional materials and those taught without instructional materials in Apa local government Area, Benue State?

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H_{o2}: There is no significant difference between the mean achievement scores of male and female students exposed to physics concepts using instructional materials in Apa Local Government Area, Benue State?

Methodology

This study employed a quasi-experimental research approach using a pre-test and post-test control group design. The choice of this design was informed by its suitability for comparing the learning outcomes of students taught with instructional materials and those taught through traditional teaching methods, while maintaining the natural classroom setting without altering existing school arrangements. The design made it possible to ascertain the impact of instructional materials on students' academic achievement in Physics by examining differences in pre-test and post-test performance between the experimental and control groups. The research was carried out in Apa Local Government Area of Benue State, Nigeria. Apa is largely a rural area with public secondary schools where Physics is offered at the senior secondary level. The area was purposively selected due to persistent poor performance of students in Physics and the limited application of instructional materials during classroom instruction. The population for the study consisted of 4,255 Senior Secondary School II (SS II) Physics students drawn from 15 public secondary schools in Apa Local Government Area. SS II students were considered appropriate for the study because they had already been exposed to fundamental Physics concepts and were not yet preparing for external examinations, making them suitable for experimental investigation. A sample of 165 SS II Physics students was selected using a multi-stage sampling procedure. In the first stage, two public secondary schools were purposively chosen from the 15 schools to ensure the presence of qualified Physics teachers and the availability of basic instructional facilities. In the second stage, intact classes from the selected schools were randomly assigned to either the experimental or control group in order to minimize disruption to normal school activities. One intact class was designated as the experimental group, while the other served as the control group. The instrument used for data collection was the Physics Achievement Test (PAT). The PAT comprised 40 multiple-choice items adapted from past West African Examinations Council (WAEC) Physics questions and structured in line with the SS II Physics curriculum. The items covered the topics taught during the treatment period and were designed to assess students' conceptual understanding, application of knowledge, and problem-solving abilities in Physics. To establish the validity of the instrument, the PAT was subjected to face and content validation by specialists in Science Education and Measurement and Evaluation. The experts reviewed the items for clarity, relevance, alignment with the curriculum, and suitability of difficulty level. Their recommendations were incorporated before the final administration of the test. The reliability of the PAT was determined using the Kuder–Richardson Formula 20 (KR-20), which is appropriate for dichotomously scored items. A reliability coefficient of 0.88 was obtained, indicating a high level of internal consistency and reliability of the instrument. Before the treatment commenced, the PAT was administered as a pre-test to both the experimental and control groups to establish their initial level of academic achievement in Physics. The experimental group was subsequently taught selected Physics topics using instructional materials such as charts, models, real objects, laboratory equipment, and improvised teaching aids. Conversely, the control group received instruction on the same topics using the conventional lecture method without instructional materials. The treatment spanned a period of seven weeks, during which both groups were exposed to equal instructional time and taught by qualified Physics teachers using identical lesson objectives and content outlines. At the end of the treatment, a post-test, which was a rearranged version of the PAT, was administered to both groups to determine the effect of instructional materials on students' academic achievement in Physics. Data obtained from the pre-test and post-test were analyzed using descriptive statistics, including mean and standard deviation, to answer the research questions. The null hypotheses were tested using the independent samples t-test at the 0.05 level of significance. All statistical analyses were performed using the Statistical Package for the Social Sciences (IBM SPSS Version 26).

Presentation of Results

Research Question 1: What is the mean achievement scores of students exposed to physics concept using instructional materials and those taught without instructional materials in APA local government Area, Benue State?

Table1: Mean, Standard Deviation Statistics Post-test PAT scores for Students in Experimental and Control Groups

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Group	N	Mean	STD	Mean difference
Experimental	80	18.01	4.80	2.97
Control	85	15.04	3.80	

Source: Field Study, 2025

Table 1 indicates that the experimental group achieved a mean score of 18.01 with a standard deviation of 4.80, whereas the control group recorded a mean score of 15.04 and a standard deviation of 3.80. The observed mean difference of 2.97 suggests that students who were taught using instructional materials performed better than their counterparts who received conventional instruction.

Research Question 2: What is the mean achievement scores of male and female students exposed to physics concept using instructional materials and those taught without instructional materials in APa local government Area, Benue State?

Hypotheses

Table 2: Mean, Standard Deviation Statistics of Post test PAT scores for Male and Female Students in Experimental Group

Gender	N	Mean	STD	Mean difference
Male	44	18.40	3.90	0.41
Female	37	17.99	4.20	

Source: Field Study, 2025

Table 2 shows that male students in the experimental group achieved a mean score of 18.40 with a standard deviation of 3.90, while female students recorded a mean score of 17.99 with a standard deviation of 4.20. The mean difference of 0.41 indicates that both male and female students exhibited very similar levels of academic achievement when taught Physics using instructional materials.

Ho_1: There is no significant difference between mean achievement scores of students exposed to physics concepts using instructional materials and those taught without instructional materials in Apa local government Area, Benue State?

Table 3: t-test analysis of difference in the academic achievement of experimental and control groups.

Group	N	Mean	S.D	D.F	T-value	P-value	Remark
Experimental	80	18.01	4.80	163	8.05	0.003	Rejected
Control	85	15.04	3.80				

p<0.05

Table 3 presents a p-value of 0.003 with 163 degrees of freedom. Since this p-value is less than the 0.05 level of significance, it indicates a statistically significant difference in the mean achievement scores between secondary school Physics students taught using instructional materials and those taught the same concepts through the conventional lecture method.

Ho_2: There is no significant difference between the mean achievement scores of male and female students exposed to physics concepts using instructional materials in Apa Local Government Area, Benue State?

Table 4: t-test analysis of achievement between male and female students in Experimental group

Group	N	Mean	S.D	D.F	T-value	P-value	Remark
Male	44	18.40	3.90	78	0.43	0.91	Accepted
Female	37	17.99	4.20				

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p<0.05

Table 4 indicates that male students achieved a mean score of 18.40 with a standard deviation of 3.90, while female students recorded a mean score of 17.99 and a standard deviation of 4.20. The mean difference of 0.41, together with a calculated t-value of 0.43 and a p-value of 0.91, suggests that there is no statistically significant difference in the academic achievement of male and female students taught Physics using instructional materials.

Discussion of Findings

The results presented in Tables 1 and 3 demonstrate a notable difference in the academic performance of students taught Physics using instructional materials compared to those taught through traditional lecture methods. This indicates that instructional resources have a pronounced positive impact on students' learning outcomes. These findings are consistent with previous research by Abdullahi (2010), Yusuf (2012), and Abubakar (2020), who reported that students exposed to instructional materials consistently achieved higher scores than their peers taught without such resources. Likewise, studies by Daniel (2021), Naki (2018), Apondi (2015), and Abdurraheem (2014) observed that the use of instructional aids enhances comprehension, simplifies complex concepts, and contributes to improved academic performance. A primary reason for this improvement is the multisensory engagement that instructional materials provide. By stimulating visual, auditory, and tactile senses, students can see, hear, and manipulate learning objects, thereby reinforcing understanding and long-term retention. Such multisensory experiences facilitate deeper cognitive processing, making learning more meaningful. From a constructivist standpoint, learners actively construct knowledge by connecting new information with prior understanding through hands-on interaction with instructional resources. Engaging both the mind and senses allows students to develop a more thorough conceptual understanding, encourages curiosity, and sustains motivation. By transforming abstract Physics concepts into concrete experiences, instructional materials make learning more interactive, enjoyable, and effective.

The findings in Tables 2 and 4 indicate no significant difference in the academic performance of male and female students taught using instructional materials. This suggests that both genders derive equal benefit from the use of these resources. These results align with those of Oguche and Yahaya (2026), Jafar et al. (2025), and Enohuean (2015), who established that gender does not significantly influence academic outcomes when instructional materials are integrated into teaching. The results underscore the inclusive nature of instructional materials, highlighting their ability to promote equity in learning achievements. These findings have several important implications. First, teacher education programs should include training on designing, selecting, and effectively using instructional materials. Educators need both pedagogical knowledge and technological skills to integrate these resources successfully into classroom practice. Second, education authorities should ensure adequate provision of high-quality, context-appropriate instructional materials to facilitate effective Physics teaching. Third, policymakers should formulate and implement guidelines that promote and standardize the use of instructional materials in schools, emphasizing innovation, inclusivity, and evidence-based teaching practices to enhance student outcomes. Despite these positive outcomes, the study has limitations. The intervention period was relatively brief, which may not capture the long-term effects of instructional materials on student achievement. Additionally, the sample size was limited, which restricts the generalizability of the findings to other populations or subjects beyond Physics. Future studies should consider longer intervention periods, larger and more diverse student samples, and other science disciplines to gain a more comprehensive understanding of the impact of instructional materials on learning. In summary, this study confirms that instructional materials significantly improve students' academic performance in Physics compared to conventional lecture methods, and that gender does not affect achievement when such resources are employed. The findings highlight the value of multisensory, constructivist approaches to teaching and emphasize the need for well-trained teachers, sufficient instructional resources, and supportive policies to ensure effective, inclusive, and engaging science education.

Conclusions

The study revealed that integrating instructional materials into Physics teaching at the Senior Secondary School level markedly enhances students' academic performance and information retention. Learners who engaged with instructional resources consistently outperformed their peers who experienced only traditional lecture-based instruction. Furthermore, the findings showed that gender does not significantly affect achievement when such materials are used, indicating that both male and female students benefit equally. These results suggest that instructional materials help clarify complex

Physics concepts, make learning more engaging, and improve understanding and long-term retention. In summary, the study highlights the essential role of instructional materials in improving the quality of Physics education and fostering meaningful learning outcomes for all students.

Recommendations

Based on the findings, the following recommendations are made:

1. The Ministry of Education and school authorities in Benue state, particularly in the study area should ensure that secondary schools are adequately equipped with instructional materials to support effective teaching and learning in Physics.
2. Teachers should be trained and encouraged to integrate instructional materials into their teaching practices. This includes learning to improvise resources when standard materials are unavailable, as this learner-centered approach can enhance student interest, engagement, and academic performance.
3. Professional development programs should be organized to equip Physics teachers with skills in using and improvising both traditional and modern digital instructional tools
4. Subsequent studies should consider larger sample sizes, longer intervention periods, and the integration of modern digital instructional materials to provide a more comprehensive understanding of the long-term impact of instructional resources on students' achievement in Physics and other science subjects.

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Influence of Social Media Devices on Level of Competency and Readiness among Tertiary Institution Librarians in Katsina State, Nigeria

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Abstract

This study examined the influence of social media devices on level of competency and readiness among tertiary institution librarians in katsina state, Nigeria. *The study specifically investigated whether librarians' competencies and readiness influence the use of social media for information service delivery. A quantitative research approach using a descriptive survey design was adopted. The population of the study comprised all one hundred and forty one librarians in the thirteen (13) tertiary institutions in Katsina State. A structured questionnaire was used for data collection and was validated by experts in Library and Information Science, statistics, and English language. Data collected were analyzed using descriptive statistics and t-test analysis with the aid of SPSS version 23. Findings revealed that librarians possessed moderate levels of competency (overall mean = 3.38) and readiness (overall mean = 3.31) in the use of social media for information service delivery. The t-test results indicated that librarians' competencies significantly influenced the use of social media for information services ($t = 2.118$, $p < 0.05$), leading to the rejection of the null hypothesis. However, librarians' readiness did not significantly influence social media use ($t = 0.277$, $p > 0.05$). The study concludes that while librarians demonstrate positive attitudes and willingness toward social media adoption, practical skills and professional competencies are more critical determinants of effective utilization than readiness alone. The study recommends continuous professional training for librarians and improved institutional support, including adequate ICT infrastructure and clear social media policies, to enhance the effective use of social media for information service delivery in academic libraries.*

Keyword: Competency, Readiness and Social Media

Introduction

The emergence and rapid growth of social media technologies have fundamentally reshaped how information is created, disseminated, accessed, and communicated across societies. In academic libraries, social media offers dynamic and interactive platforms for engaging users, promoting library resources, facilitating communication, and supporting instructional and reference services. Unlike traditional one-way communication models, social media platforms allow for real-time interaction between librarians and users, thereby enhancing engagement and fostering collaborative information environments. Platforms such as Facebook, WhatsApp, Twitter, Instagram, LinkedIn, blogs, and YouTube serve not only as promotional tools but also as channels for selective dissemination of information, current awareness services, user engagement, and professional networking (Agada, 2018; Okoroma, 2017; Tekale & Dalve-Pati, 2019). Librarians' competency in social media refers to the knowledge, technical skills, attitudes, and professional abilities required to effectively adopt and integrate social media into library service delivery. This includes the ability to create, curate, and disseminate content, engage with patrons in online spaces, and leverage analytics to assess impact. Competency also embraces adaptability and continuous learning, which are essential in navigating the evolving landscape of digital communication and information technologies (Jain, 2013; Joshi & Deshpande, 2019; Igwela & Nsirim, 2018). Similarly, readiness describes librarians' preparedness including technical capability, organizational support, infrastructure, policy frameworks, and positive attitudes to adopt social media as part of their professional practice (Shaik, 2019; Abdulsalami & Dik, 2019). While a positive perception of social media may predispose librarians to use these tools, readiness reflects the degree to which librarians and their institutions are equipped and willing to implement and sustain social media practices. Recent studies in Nigerian university contexts have shown that although librarians generally have a positive perception toward social media and recognize its potential benefits for information dissemination and professional development, actual utilization tends to be moderate or constrained by infrastructural, institutional, and skill-related

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challenges. For instance, Promise, Roland, and Mercy (2020) reported that academic librarians recognize the roles of social media in disseminating library information, but actual usage is limited and requires improved skills training and platform development. Similarly, Altaf (2021) emphasized that institutional support and technical readiness are critical factors for effective social media integration in academic libraries. This study Anchored on the Technology Acceptance Model (TAM) developed by Davis (1989), which posits that perceived usefulness and ease of use influence technology adoption behavior, this study investigates the relationship between librarians' competencies, readiness, and their use of social media for information service provision in higher institutions of learning in Katsina State. By examining these relationships, the study aims to provide insights into how academic libraries in higher institution of learning can better support librarians in leveraging social media for enhanced service delivery.

Statement of the Research Problem

Academic libraries are increasingly expected to adopt digital tools to meet the evolving information needs of students, scholars, and other stakeholders. Social media, in particular, has emerged as a promising means of expanding outreach, enhancing communication, marketing library products and services, and fostering user engagement (Agada, 2018; Tekale & Dalve-Pati, 2019). Yet, despite the widespread adoption of social technologies among students and the broader academic community, effective integration of social media into library operations remains a significant challenge for many institutions, particularly within developing contexts such as Nigeria (Okoroma, 2017; Otibor, 2016). In Katsina State's higher institutions of learning, librarians may hold positive attitudes toward social media and acknowledge its potential benefits. However, many libraries still demonstrate limited use of these technologies for structured information service delivery, advocacy, and engagement with users. A key concern is the degree to which librarians' competencies and readiness affect their actual adoption and use of social media for information services. Studies in other Nigerian contexts have revealed that librarians frequently use social media platforms such as Facebook, WhatsApp, and YouTube, but the extent of usage is often constrained by inadequate ICT infrastructure, limited formal policies, scarcity of training opportunities, poor internet access, and low familiarity with strategic social media practices (Promise, Roland, & Mercy, 2020; Altaf, 2021; Otibor, 2016). There is limited empirical evidence specifically examining how competency and readiness jointly influence librarians' use of social media in the context of Katsina State tertiary institutions. While some research suggests a positive relationship between social media use and service delivery outcomes, including professional development and information dissemination, the evidence on how readiness beyond perception shapes adoption remains mixed (Shaik, 2019; Abdulsalami & Dik, 2019). For instance, although librarians may perceive social media positively, institutional barriers such as lack of policy support, infrastructure gaps, and inadequate training may hinder effective use. This gap in understanding potentially undermines efforts to develop targeted strategies, professional development programs, and institutional policies aimed at enhancing social media integration in academic libraries. Therefore, this study aims to bridge this empirical gap by examining the influence of librarians' competencies and readiness on the use of social media for the provision of information services in higher institutions of learning in Katsina State, Nigeria

Objectives of the study

The main objective of the study is to examine influence of social media devices on level of competency and readiness among tertiary institution librarians in katsina state, nigeria .The specific objectives are to:

1. Determine whether librarians' competencies influence the use of social media for the provision of information services in Katsina State tertiary institutions.
2. Examine whether librarians' readiness influences the use of social media for the provision of information services in Katsina State tertiary institutions.

Research Questions

The study was guided by the following research questions:

1. Do librarians' competencies influence the use of social media for the provision of information services in Katsina State tertiary institutions?
2. Does librarians' readiness influence the use of social media for the provision of information services in Katsina State tertiary institutions?

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Hypotheses

H_{o1}: Librarians' competencies do not significantly influence the use of social media for the provision of information services in Katsina State tertiary institutions.

H_{o2}: Librarians' readiness do not significantly influences the use of social media for the provision of information services in Katsina State tertiary institutions.

Methodology

The study adopted a quantitative research approach based on the positivist paradigm and employed a descriptive survey research design. The population comprised all librarians in the thirteen (13) tertiary institutions in Katsina State, totaling one hundred and forty-one (141). Due to the manageable size of the population, the entire population was used for the study, in line with Klassen, Plano Clark, and Smith (2011). Data were collected using a structured questionnaire with closed-ended questions. The instrument was validated by experts in Library and Information Science, statistics, and English language. A pilot test involving 40 librarians outside the study population was conducted to ensure reliability. Data were analyzed using descriptive statistics (frequency, percentage, mean, and standard deviation) and inferential statistics (t-test) with SPSS version 23.

Presentation of Results

A total of 141 questionnaires were administered to librarians across the 13 tertiary institutions in Katsina State. Of these, 120 valid responses were returned, representing an 85% response rate, which is sufficient for meaningful analysis.

Table 1: Do librarians' competencies influence the use of social media for the provision of information services in Katsina State tertiary institutions?

S/N	Statements	Mean	Std. dev	Decision
1	I am confident in using social media platforms for professional purposes	3.45	0.52	Agree
2	I can create and share library content on social media platforms	3.36	0.60	Agree
3	I understand the functionalities of different social media platforms	3.30	0.55	Agree
4	I can evaluate the effectiveness of social media for library services	3.28	0.57	Agree
5	I am willing to adopt innovative technologies for service delivery	3.50	0.48	Agree
	Overall mean	**3.38**	**0.54**	**Moderate competency**

Table 1 reveals that librarians in Katsina State tertiary institutions perceive themselves as moderately competent in using social media for information service provision, with an overall mean score of 3.38. The highest mean score (3.50) was recorded for willingness to adopt innovative technologies, indicating a positive disposition toward technological change. Similarly, confidence in professional use of social media recorded a high mean (3.45), suggesting that most librarians feel comfortable engaging with social media platforms in their professional roles. However, relatively lower mean scores were observed in areas related to evaluating social media effectiveness (3.28) and understanding platform functionalities (3.30), indicating gaps in advanced analytical and strategic competencies. These findings suggest that while librarians possess basic operational skills, there is still a need for enhanced training in strategic content management and impact assessment. This result supports earlier studies by Jain (2013), Joshi and Deshpande (2019), and Igwela and Nsirim (2018), which found that academic librarians often demonstrate moderate social media competencies but require further capacity building to maximize effectiveness.

Table 2: Does librarians' readiness influence the use of social media for the provision of information services?

S/N	Statements	Mean	Std. dev	Decision
1	I am willing to adopt social media in my daily library activities	3.40	0.50	Agree
2	The library provides adequate technical support for social media use	3.25	0.55	Moderate
3	Adequate infrastructure exists to support social media in the library	3.10	0.60	Moderate

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4	I am open to organizational policies that promote social media usage	3.35	0.48	Agree
5	I am prepared to learn new skills to use social media effectively	3.45	0.50	Agree
	Overall mean	**3.31**	**0.53**	**Moderate competency**

Table 2 indicates that librarians exhibit moderate readiness to adopt social media for information service delivery, with an overall mean of 3.31. High mean scores for preparedness to learn new skills (3.45) and willingness to adopt social media (3.40) demonstrate positive attitudes toward innovation. These findings reflect an openness among librarians to embrace emerging technologies. However, the relatively lower mean scores for infrastructure availability (3.10) and technical support (3.25) highlight institutional and organizational challenges that may constrain effective implementation. This suggests that although librarians are personally ready and motivated, systemic limitations may prevent readiness from translating into consistent social media use. These findings align with Altaf (2021) and Otibor (2016), who emphasized that institutional readiness is as critical as individual willingness.

Table 3: Librarians' competencies do not significantly influence the use of social media for the provision of information services in Katsina State tertiary institutions

Level of Competency	Mean	Std. dev	T-cal	df	P-value	Decision
Competent	3.36	0.383				
			2.118	58	0.783	Not sig.
Less Competent	3.15	0.386				

The independent samples t-test result ($t = 2.118$, $p = 0.038 < 0.05$) indicates that librarians' competency significantly influences the use of social media for information service provision. Therefore, the null hypothesis (Ho_1) is rejected. Librarians with higher levels of competency are more likely to use social media effectively for professional library services. This finding corroborates Shaik (2019) and Abdulsalami and Dik (2019), who reported that technical skills, confidence, and professional competence are key predictors of technology adoption in academic libraries.

Table 4: Librarians' readiness do not significantly influences the use of social media for the provision of information services in Katsina State tertiary institutions.

Level of Readiness	Mean	Std. dev	T-cal	df	P-value	Decision
Ready	3.32	0.321				
			0.277	58	0.783	Not sig.
Less ready	3.27	0.408				

The t-test analysis ($t = 0.277$, $p = 0.783 > 0.05$) shows that librarians' readiness does not significantly influence their use of social media for information services. Consequently, the null hypothesis (Ho_2) is accepted. This suggests that although librarians may express willingness and openness, readiness alone does not guarantee actual usage. Structural challenges such as inadequate infrastructure, lack of formal policies, and insufficient technical support may prevent readiness from translating into effective practice.

Discussion of Findings

The study revealed that librarians in Katsina State tertiary institutions perceive themselves as moderately competent in the use of social media for information service delivery (overall mean = 3.38). They also demonstrate moderate readiness to adopt social media tools (mean = 3.31), characterized by positive attitudes and willingness to learn new skills. However, infrastructural inadequacies and limited technical support remain major constraints. Inferential analysis showed that librarians' competency has a statistically significant influence on the use of social media, while readiness does not significantly influence usage. This indicates that practical skills and professional abilities play a more critical role than willingness alone. These findings align with Shaik (2019), Abdulsalami and Dik (2019), and Jain (2013), who emphasized that competence is a strong determinant of technology adoption. The lack of a significant relationship between readiness and usage contrasts with Altaf (2021), suggesting that in the Katsina State context, institutional and infrastructural barriers may weaken the effect of readiness. This study extends existing literature by empirically distinguishing between competency and readiness, demonstrating that competency is a more direct predictor of social media utilization in academic libraries.

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Conclusion

The study concludes that social media is an essential tool for enhancing information service delivery in academic libraries in Katsina State. Librarians possess positive perceptions and moderate levels of competency and readiness toward social media use. However, while competency significantly influences actual utilization, readiness alone does not. This underscores the importance of continuous skills development, adequate infrastructure, and supportive institutional policies to enable effective integration of social media into library services.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Academic institutions should organize regular capacity-building programs, including workshops and hands-on training, to enhance librarians' competencies in social media management, content creation, and analytics.
2. Tertiary institutions should invest in reliable ICT infrastructure, stable internet connectivity, technical support systems, and clear social media policies to create an enabling environment for effective social media use in library service delivery.

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Assessment of Social Learning Platforms on Students' Engagement and Retention in National Open University of Nigeria

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Abstract
Social learning Platforms is important channel of facilitation. National Open University of Nigeria which is one of the open and learning institutions in Nigeria have introduced these modes of instruction for her students in recent times. It is because of this that the study seeks to assess the impact of these modes of instruction to students in National Open University of Nigeria. Two questions were formulated, moreover, qualitative approach was adopted. Focus group was used, Moreso, thematic analysis was used to analyse the data. Findings indicated among others that the use of these modes has encouraged students to actively participate in various academic activities. The recommendations reached among others is that university management should provide laptops to every student to enable them to participate in the lecture.
Keyword: Social Learning Platforms, Students' Engagement, Retention, Open and Distance Learning Institutions

Introduction
The integration of technology into education has significantly transformed teaching and learning processes especially in Open and Distance Learning (ODL). Among the technological advancements, Social Learning Platforms (SLPs) have emerged as indispensable tools for fostering learner engagement and retention. The platforms combine pedagogy and technology to create dynamic and interactive virtual spaces which allow learners to collaborate, communicate, and actively engage with peers, instructors, and educational content. Features of SLPs which play a crucial role are discussion forums, live chats, multimedia sharing, group projects, and real-time feedback foster collaboration and critical thinking involved on ODL settings (Wang et al., 2022). In National Open University of Nigeria (NOUN), the institution adopts SLPs in expanding access to learning for diverse learners which include professionals, rural inhabitants and non-traditional students. Despite its flexibility, ODL faces persistent challenges, particularly in terms of learner engagement and retention. The use of SLPs can enhance learner engagement by offering interactive tools that encourage communication, collaboration, and idea-sharing, helping to combat the isolation often felt in ODL settings (Wang et al., 2022). However, the use of SPLs in ODL institutions necessitated the active engagement of students in learning process and teachers on the teaching activities. Furthermore, SPLs initial students' retention through students enrolled and committed to completing their courses. For ODL institutions such as NOUN, students' engagement and retention is crucial as high dropout rates among students. Aydin, Öztürk, Büyükköse, Er, and Sönmez (2019) argued that the basis for learners to drop-out might be unsatisfactory results in exams, lack of application of SPLs, lack of knowledge about the open education system, time management issues, unsuitability of the registered program, interference of daily life routines on studies, and some personal problem. On the other hand, Bağrıacık Yılmaz and Karataş (2022) says that the quality of educational and technical support such as the provision of SLPs by the institution is important in the reduction of students drop out in ODL institutions. In the light of

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the narrative, the study seeks to examine the assessment of SLPs on Learners' Engagement and Retention in National Open University of Nigeria.

Objectives of the study

The following research objectives were formulated to guide the study, listed below;

1. Examine the Social Learning Platforms (SLPs) most frequently used by NOUN students for academic engagements.
2. Assess the impact of Social Learning Platforms (SLPs) on students' engagement and retention NOUN over the last five academic years.

Research Questions

Considering the above stated objectives, the research questions were out to guide the study;

1. Which Social Learning Platforms (SLPs) are most frequently used by NOUN students for academic engagements?
2. What is the impact of Social Learning Platforms (SLPs) on students' engagement and retention in NOUN over the last five academic years?

Theoretical Framework

The theory that underpins the study is known as social learning theory (SLT) propounded by Albert Bandura in 1977. This theory say that people learn by observing, imitating the behaviours, attitudes and emotional reactions of others. Bandura opined that SLT cardinal points are that Learning is not purely behavioral, rather, it is a cognitive process that takes place in a social context. Secondly, learning can occur by observing a behavior and by observing the consequences of the behavior (vicarious reinforcement). Thirdly, learning involves observation, extraction of information from those observations, and making decisions about the performance of the behavior (observational learning or modeling). Thus, learning can occur without an observable change in behavior. Fourthly, reinforcement plays a role in learning but is not entirely responsible for learning, and, that the learner is not a passive recipient of information, rather, cognition, environment and behaviour all reciprocally influence each other. Considering the above discussion, Akers and Jennings (2015), Deaton (2015, p.20) argued that "social media technologies have fundamentally changed the way that social interaction occurs within our world." In addition, teachers at all levels adopt social media to engage students in a new paradigm of human interaction and social learning. Applications of social media have been used in the classroom to promote critical thinking and reflection (Daniels & Billingsley, 2014). Rumjaun and Narod (2025) is of the view that to "enhance the cognitive processes of attention, memory, and motivation, social media provides a platform for improving learning in a social context." Based on the above discourse, the theory is relevance as it would be used to look at influence of social learning platforms on learners' engagement and retention in NOUN.

Literature

In recent times, learning and teaching activities in higher institutions have taken place on SLPs. It, therefore, obvious that learning and teaching processes have migrated from the conventional face-to-face level to virtually platforms. From all indications, these platforms have created virtual learning communities that replicate the collaborative and interactive dynamics of traditional classrooms (Okoro & Uche, 2021). In fact, this is affected by offering avenues of communication such as discussion forums, real-time messaging, collaborative projects, and feedback systems. SLPs foster a sense of belonging, enhance motivation, and support meaningful engagement among learners. Moreover, SLPs provide opportunities for peer-to-peer interaction and mentorship, which are critical for sustaining learner's commitment, therefore, reducing feelings of isolation. Babayev (2025) stated that "social platforms have become major tools in language learning recently." Social networking sites like YouTube, Skype, Instagram, Facebook (Akpan, 2023), and Twitter provide learners with the opportunity to keep in touch with native speakers in cultural contexts and pick up the language how it is used in everyday speech (Huseynzade, 2025). During COVID-19 pandemic, Zoom, Skype and Microsoft Teams were frequently used social platforms in language learning in the universities globally to avoid the spread of the disease (Babayev, 2021). Aside from using platforms for disease spread, student communities are usually encouraging using social platforms for collaborative learning, therefore, creating a sense of belonging among learners (Alsenafi, AlSabbagh, Alhaji & Alghasab, 2024). It is not out of place to argue that learners do not have to stay in pre-defined teaching constellations, instead, they choose their own learning cohorts. Furthermore, Alalwan et al. (2019) also submitted that social media enhances students' learning activities by providing them with another platform to share their knowledge, information, and discussions with others.

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Despite the numerous advantages of SPLs, the issue of students' engagement, therefore, comes into play. Here, students' engagement refers to "students' active participation in educational activities as well as their dedication to academic goals and learning" (Chiu, 2021). In another vein, Qureshi et al. (2021) opined that students who take part in the learning process usually learn better than others. Patricia Aguilera-Hermida (2020) argued that students' engagement positively influences their learning performance. The retention level of students using SPLs has advanced. Reynolds et al. (2009), Sengupta and Williams (2021) declared that students' academic success is enhanced when institutions offer various academic and social programs to support students and develop processes that encourage student participation in the programs. Similarly, SLPs are effective avenue for raising students' satisfaction and retention through alleviating their feelings of isolation and lack of impersonal interactions (Li et al. 2014).

Methodology

The study adopts qualitative approach. However, the choice of qualitative method is to unravel the influence of social Learning platforms on learners' engagement and retention in NOUN. In line with qualitative method deployed for the study, interpretive paradigm was adopted respectively. Drawing from Almeida's (2018) position the reason for the adopting interpretive paradigms is to use as a lens for a more thorough exploration of complex issues of social learning platform on learners. The population for the study is the final-year undergraduate students in NOUN across various faculties in NOUN. According to official document from the office of the Registrar indicated that there are 4267 students. Moreso, purposive sampling technique was used to select the sample size of 40 participants. From the above sample size, it is incumbent to state that the reason for the use of small sampling size is to explore the problem space and identify potential issues. Moreover, small sampling size is used to allow for detailed, nuanced data collection and analysis.

The instrument for the study is semi-structured interview. The semi-structured interview bothers on the research questions earlier stated, and it consists of fifteen questions. The choice of semi-structured interview aside from understanding the phenomenon under investigation, Johnson and Matthews (2021) says that it is out for in-depth information regarding students' experiences on the effective use of the platform for academic advancement or otherwise. In line with qualitative methods used, the trustworthiness of the instrument was established through credibility, transferability, dependability and confirmability. Before the interview, the researchers ensured that all ethical issues were adhered to. For instance, to ensure that participants willingly accept in the participation of the research, a Consent Form (CF) was designed, and it was given to each participant to sign indicating their voluntary participation in the study. The researchers did not employ any research assistant, rather, they used focus group for the study. In other words, the 40 participants were grouped in four groups, that is, ten participants per group. Each researcher was armed with an audio recorder and field note during the interview. After the interview, the information was collated, and it was transcribed using Nvivo (software for transcription and data analysis). After transcription, the data was subjected to open coding for categorisation. Moalusi (2020, p.85) stated that "categorisation of data is necessary for a qualitative study to reduce the number of concepts a researcher must work with and to build a big picture of the issues salient to understanding a social phenomenon under investigation." After categorisation of the data, the emergence themes were analysed using thematic analysis. Drawing from Lochmiller (2021), the choice of thematic analysis is to identify the recurring patterns that are presented by researchers as overarching statements or themes.

Presentation of Results

Research Question 1: Which Social Learning Platforms (SLPs) are most frequently used by NOUN students for academic engagements?

The themes which featured prominently from the participants' responses were as follows: NOUN students used Zoom and Moodle.

Students used to Zoom

Participants were asked on the SLPs that were mostly frequently used, in their responses they unanimously said that they frequently used Zoom for their academic activities. In fact, Focus Group 'A' believed most lecturers in all departments in the university used zoom to interact with the students during facilitation. When the interviewers interrogated the participants why they frequently used zoom for their academic activities, Focus Group 'A' responded:

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> *It is a pleasure to inform you that zoom is the easiest way to use it in class. With the link provided by the lecturer, one can easily link up to the class. Furthermore, aside from the easy nature of this mode, it is cheap to buy data for its use.*

In a similar vein, Focus Group 'C' said that zoom is one of the modes of communication that students use in the university frequently. When the interviewers probed further why students in this university used it frequently. In response, Focus Group 'C' opined that "*it is frequently used because it can be assess through one mobile phone.*" You know, every student in this campus have a mobile device." From the above except, it is obvious and undeniably fact that zoom is mostly used by National Open University of Nigeria students. In fact, based on the participants' assertion, zoom is easy to be used by all students in the university because of accessibility of the data from internet providers.

Usage of Moodle by Students

Another mode in which National Open University of Nigeria students used frequently is moodle. The participants from Focus Group 'D' categorically mentioned that moodle is a free, open-source online learning platform, or learning management system used by most universities to deliver online lectures to students. Aside from the above notion, Focus Group 'D' went on to say that moodle allows lecturers to manage courses and create interactive learning environments with activities like quizzes and forums and track student progress. Similarly, Focus Group 'B' informed the interviewers that this mode of communication is newly introduced by the university management, therefore, it is not commonly used by most of the lecturers. However, few lecturers in some departments are using this moodle to facilitate their courses in this university. At this juncture, the interviewers probed further if zoom and moodle which one is commonly and frequently used by the lecturers. Responding, Focus Group 'A' insisted that zoom is frequently used more to facilitate online courses than moodle. From the above discourse, it is enough to argue that moodle mode of online facilitation is not frequently and commonly used like zoom. Though few lecturers in National Open University of Nigeria used this mode for their online facilitation. Moreso, participants (students) submitted that this mode of online interaction is rarely used, since it was introduced in the university newly, hence the students could not adapt to this method of facilitation.

Research Question 2: What is the impact of Social Learning Platforms (SLPs) on students' engagement and retention in NOUN over the last five academic years?

From all indications, the themes that emerged from the analysis of the data are as follows: Zoom and moodle enhances academic performance, enhances students' participation and retention of students.

Zoom enhances students' academic performance

The entire participants for the study informed the interviewers that since the introduction of zoom and moodle facilitation in NOUN, students' academic performance has improved significantly in recent times. In fact, Focus Group 'C' and 'A' stated that since the introduction of modes of facilitation, students can study effectively. Moreover, these Focus Groups were of the view that when they read their course materials before explanation by the lecturers, they can comprehend difficult concepts of the course(s). Additionally, Focus Group 'B' said that when these modes of communication were not in use in the university, students find it difficult to read on their own and comprehend. When the interviewers probed further what happens if any student misses a class, Focus Group 'D' replied:

Sir, we want to inform you that these modes of facilitation are the best thing to happen. If any student misses the online facilitation, there are ways he or she would listen to the lecture during his or her space time. The link for the online facilitation missed would be sent to the whole student. Therefore, anyone that missed can listen to it.

The above excerpt indicated that since the introduction zoom and moodle as modes of online facilitation, students' academic performance has improved since the last five years. In fact, students listen to online facilitation through these modes of communication. When the interviewers ask the participants what would happen if a student missed this online facilitation? In answering this question, it was revealed that students are/are given the opportunity to listen to already recorded one in his/her comfort time and zone.

Students' participation in class activities

Another theme featured from the data analysis is that of students' participation in class activities. Focus Group 'A' narrated that since the introduction of the SLPs by the university management in 2021, students in all departments have taken their studies seriously unlike previous years when these modes used were not introduced. Similarly, Focus Group 'C' informed these researchers that the introduction of this method of facilitation is the best for the students. This is because it allows students to participate actively during facilitation. When the interviewers asked the participants to explain on this assertion,

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they replied, "*we are compelled to actively participate on the facilitation by ensuring that all students who offer participate on the discussion virtually and answer certain questions put up by the lecturer."* In the same vein, Focus Group 'D' reported that few lazy students who always exhibit unconcern attitude towards their studies are forced to engage actively in the studies. Additionally, Focus Group 'B' mentioned that this mode of instruction allows students to also participate in the assignment given by the lecturer. The above narrative by the participants revealed that due to the introduction of SLPs students were made to engage actively in the class. In fact, according to these participants the application of SLPs for instruction necessitated students to participate in the assignment given by the lecturers.

Retention of students in School

All the participants unanimously agreed that the introduction of the mode of instruction is a worthwhile gesture. The reason advanced by Focus Group 'B' was that the mode of instruction introduced by university management has made students focus on their studies. Moreover, before now many students were compelled to drop from the university because of their ability to measure up with the demand required by the studies. When the interviewers probed further how they understood that there is a drop-in attrition rate on the population of students, they replied:

> *Sir, we want to advise you to go to the registry department of the university and request the retention rate of students. You would discover that the retention rate of students' population is high, when one compares it with what is obtainable ten years ago.*

In addition to above students' of Focus Group 'B', It was stated by Focus Group 'D' that the last year (2024) they glanced through the University Bulletin, they discovered that there is a dropped on attrition rate of students population and that students who dropped out of the university are made to re-enroll for the completion of their studies due to the introduction of SLPs by the university management. The above excerpt from the participants indicated that because of the introduction of SLPs by the university management, students' retention rate is high, and the attrition rate is extremely low when one compares with years gone by.

Discussion of Findings

From the findings, it was indicated that the SLPs used most frequently by NOUN students for academic purposes were zoom and moodle. The past five years brought about the introduction of SLPs by the management of the university. From all indications, students' usage of zoom and moodle was encouraging and effective. Despite the fact there are many modes of instruction such as google classroom, telegram, among others, however, students of NOUN frequently used zoom and moodle. It may be argued that the basic reason for the use of these two modes is based on the fact it is the cheapest and access for students. At least, it is obvious that every student has mobile phone in which he/she can link to lecture facilitation. This finding is supported by Olawole (2016) who held that undergraduates of Obafemi Awolowo University in Ile Ife, Nigeria frequently made use of zoom and moodle for their field trip in geography. Furthermore, Edobor, Solomon and Omwanghe (2023) opined that undergraduate student from public universities in Edo state adopted zoom and moodle their utilization during academic activities. The impact of SLPs on NOUN students was enormous. In fact, the findings from the second question have shown that zoom and moodle enhance students' academic performance, promote students' participation in the class and it brought about students' retention in the university. Students offering one programme or the other in an open and distance institution in Nigeria use zoom and moodle. The use of zoom and moodle as modes for instruction significantly impact students' academic performance. Aside from the fact that these modes of instruction promote academic performance of students, it also enhances participation in academic activities. It may be argued that virtual interaction between students and lecturers promotes effective communication which eventually leads to students' participation in class activities. The use of zoom and moodle despite motivating students to study hard, the attrition rate of students in the university is equally low which prompts high retention rate. These findings collaborated with Alameri, Masadeh, Hamadallah, Ismail, Fakhouri (2020); Ezeude Nneka, Akonu Stephanie and Elochukwu (2023) who claimed that these platforms significantly impact students' participation and retention in the universities. In another circumstance, Mohammed, Ekpo, Olatunde-Aiyedun, Zakari and Ogar (2025) reported that zoom and moodle motivate students to take their studies seriously.

Conclusion

NOUN is known for open and distance learning in Nigeria. It serves thousands of people by educating those who could not access conventional university institutions. The last ten years of the institution have witnessed poor academic participation, low academic performance and high attrition rate. However, with the introduction and usage of SLPs during facilitation by

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the university management, NOUN students have positively and undeniably participated in various academic activities. Furthermore, students' academic performance has reached all time high since the use of SLPs as modes of instruction during facilitation. The aftermath of students' participation in various academic activities played a crucial role in raising students' academic performance. This discourse eventually led to students' retention in NOUN, which the university management graduated about 17,420 students at its 14th Convocation Ceremony last April 12, 2025.

Recommendations

From all indications, the findings indicated that introduction and usage of SLPs by the university management has encouraged NOUN students to participate in various academic activities, reduced poor academic performance and raised students' population. It is, therefore, recommended that;

1. University management should provide internet in all study centres for NOUN students to use since most of them hardly have data to participate in the facilitation.
2. From interview, it was informed by the participants that majority of the students use mobile phones for facilitation. Therefore, university management should provide laptops for students who could acquire one to ease their participation in the lecture.

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Qualitative Study of Design-Based Learning Strategy on Achievement and Conceptual Understanding in Electromagnetism among University Undergraduate Physics Education Students in Northwest, Nigeria

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Abstract
The study explores the effectiveness of design-based learning on academic achievement and conceptual understanding, in electromagnetism among undergraduate university students in northwest, Nigeria. Two (2) research objectives, and two (2) research questions were raised to guide the study. The study employed phenomenological qualitative research design. The population for this study comprised Nine Hundred and Forty-One (941) 300L Undergraduate pre-service physics teachers in the Department of Science Education. The sample for the study were Eight (8) undergraduate physics students purposefully selected for the study. Validated Observation Schedule and Interview Protocol were used to collect data. Thematic analysis was used to analyze the data. The findings from the study revealed that Undergraduate University physics students had positive learning experiences, actively participated during the process. It was concluded among others the use of DBL improve undergraduate university physics students' academic achievement and foster students conceptual understanding in electromagnetism. It was recommended that lecturers should incorporate design-based learning strategy element such as real-world problem, prototyping, and collaboration to illustrate physics concepts particularly electromagnetism, making the subject more relevant and engaging for students and government should provide resources and support for curriculum innovation and development, encourage interdisciplinary collaboration between physics educators and engineers to develop interdisciplinary courses and projects that promote real-world applications.

Keywords: Design-Based Learning, Achievement, Conceptual Understanding, Electromagnetism

Introduction
Electromagnetism is a branch of physics that deals with the study of electric and magnetic fields and their interactions with matter. The study of electromagnetism began with the observation of natural phenomena like lightning and magnetism in ancient times and that rubbing amber with fur would attract small objects, an early observation of static electricity. Electromagnetism is fundamental to understanding a wide range of physical phenomena and has numerous applications in technology, including electrical engineering, telecommunications, and medical imaging. Majority of physics students encounter difficulties in the process of learning Electromagnetism, due its abstract nature, lack of interest, negative influence of pre-scientific concepts, cognitive impairment of learning, mathematical learning disability and learning burnout (Liu, 2019). These learning difficulties have led to low achievement at universities (Mahmudah *et al.,* 2022; Delen & Sen, 2023; Dognia & Dah, 2023). Nabilah *et al.,* (2019) found that students have difficulties in understanding the meaning of electricity, alternating current, magnetism and AC Circuit. As a result, several researches on students' conceptual understanding of electricity and magnetism have been carried out and several instructional strategies have been suggested for conceptual change in this topic (Mbonyiryivuze *et al.,* 2019) and design-based learning could form part of the innovative strategy that can provide conceptual changes (Shin *et al.,* 2023).

Electromagnetism is a critical component of physics education, with applications in various fields, including engineering, technology, and medicine. However, students' understanding of electromagnetism concepts has been a subject of concern, with many students exhibiting misconceptions and difficulties in applying the principles to real-world problems. In Nigeria, the teaching and learning of electromagnetism at the university level face several challenges, including inadequate resources, poor teaching methods, and a lack of valid assessment tools. The development of a valid and reliable achievement test in electromagnetism can help identify areas where students need improvement, inform instruction, and enhance student learning outcomes.

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Academic achievement as a measure of what a person has accomplished after exposure to an educational programme. It is a means of accomplishment or proficiency of performance in a given skills or body of knowledge. Abumchukwu and Okeke (2020) opined that students' academic achievement corresponds to their performance in school subjects as symbolized by a score on achievement test. It is commonly measured by means of examination or continuous assessments, it represent the level of success of the teaching and learning process, it indicate the extent to which the established goal have been achieved, it also provides feedback to the teacher and student. Surino *et al.,* (2024) noted that one of the most worrying issues in learning physics is how students understand concept and suggested the use of innovative and more engaging instructional strategy that could make students have deeper understanding of concept, gain reasonable academic achievement thereby reducing students learning burnout.

Conceptual understanding is the ability of learners to connect and organize knowledge, which were useful in integrating theory and practice in daily life (Nur'aini *et al.*, 2023). When the relationship between theory and practice are established, then learning were more meaningful and hence conceptual understanding is attained which may positively affect the development of life-career skills. Conceptual understanding is very important for developing life-career skills such as flexibility, adaptability, initiative, self-direction, productivity, accountability, leadership and responsibility which are also essential for higher academic achievement and life in the 21st century. Conceptual understanding are developed when real life problems are used to teach a concept. Students' understanding of concepts changes through active participation and designing solutions to related problems through identifying real life problems, generating information, designing prototype and evaluation of the designed prototype thereby enhancing students' academic achievement (Santika & Herdi, 2020).
Electromagnetism is a fundamental concept in physics that is crucial for understanding various technological applications, including electric motors, generators, and transformers. Despite its significance, electromagnetism is often reported as a challenging topic for students, leading to poor academic achievement and misconceptions. Traditional teaching methods, which emphasize theoretical and lecture-based approaches, have been criticized for failing to engage students and promote deep understanding. In contrast, design-based learning offers an innovative approach that combines hands-on design activities with conceptual learning, fostering creativity, problem-solving skills, and deeper understanding of scientific concepts (Dessie *et al.*, 2023). The Nigerian educational context, characterized by large class sizes and limited resources, further underscores the need for effective and engaging teaching approaches like design-based learning. This study aims to investigate the impact of design-based learning on senior secondary school students' academic achievement and conceptual understanding of electromagnetism.

Statement of the Problem

Despite all the importance of physics education to the development of any nation, pre-service physics teachers find learning physics concepts difficult specifically the aspect of electromagnetism. Common learning difficulties students face in Physics could range from students inability to visualize both electric and magnetic fields as they are invisible and often have trouble linking theoretical concepts to real-world applications, such as in generators, transformers and everyday electronics (Ergül & Çalış, 2021). These learning difficulties have led to low achievement of students at Universities and other level of education. The persistent poor academic achievement and inadequate conceptual understanding of electromagnetism among senior secondary school students in Nigeria, despite its importance in physics and everyday applications, necessitates an exploration of innovative teaching approaches. Design-based learning, which integrates hands-on design activities with conceptual learning, has shown promise in enhancing student learning outcomes in STEM subjects. However, its effectiveness in improving academic achievement and conceptual understanding of electromagnetism in Nigerian senior secondary schools remains unexplored.

Research Objectives

The main aim of this study is to explore the effectiveness of design-based learning on academic achievement and conceptual understanding in electromagnetism among undergraduate university students in Northwest, Nigeria. The specific objectives are set to:

1. explore undergraduate students experiences to Design-Based Learning Instructional Strategy and how it could influence their achievement in Electromagnetism.
2. explore undergraduate students experiences to Design-Based Learning Instructional Strategy and how it could influence Conceptual Understanding in Electromagnetism.

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Research Questions

Based on the stated research objectives, the following research questions were raised to guide the study:

1. What are the undergraduate students' experiences to Design-Based Learning Instructional Strategy and how it could influence their achievement in Electromagnetism?
2. What are the undergraduate students experiences to Design-Based Learning Instructional Strategy and how it could influence Conceptual Understanding in Electromagnetism?

The study employed qualitative research design specifically phenomenological design. This is a type of qualitative research design that allow researcher to collect views, feelings and thought from a number of participants which was used to describe what all participants have in common as they experience a phenomenon (Creswell, 2014). The design was used to seek pre-service teachers' views regarding their experience with Design-Based Learning and its effectiveness in fostering conceptual understanding, improving academic achievement and reducing burnout. The design is illustrated as in figure 1.

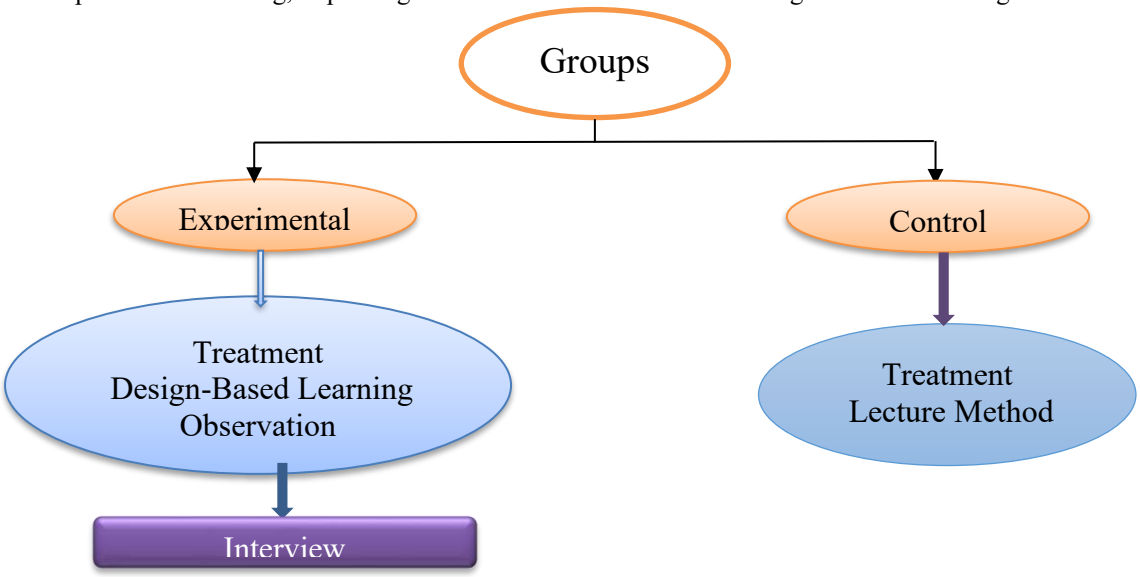

Figure 1: Qualitative Research Design Layout

The population for this study comprised all the 300L undergraduate pre-service University physics teachers from the thirteen (13) Universities in North-West, Nigeria, offering Physics Education as a course with total number of Nine Hundred and Forty One (941) 300L Undergraduate pre-service physics teachers in the Department of Science Education. The sample for the qualitative aspect was determined using recommendation made by Bekele and Ago (2022); Adler and Adler as cited in Daniela (2020) whom suggested that if a selected sample is relatively homogeneous, 6-12 participant are enough for one qualitative research. Since the population is relatively homogeneous, eight (8) undergraduate physics students were used for the interview. Purposive sampling technique was used to select Eight (8) undergraduate pre-service Physics teachers from the population of the study based on the following criteria: participant who have experienced the phenomena through exposure to Design-based Learning instructional strategy, students that can communicate and feel free to respond to the interview question, and gender consideration. On that basis, only experimental group that were taught using design-based learning instructional model are selected and participated in the qualitative part of the study.

Two instruments were used for data collection and these are: Undergraduate Physics Students' Observation Schedule developed by the researcher and it consist of three (3) sections. Section (A) contained basic information of students such as; University code, gender, research group, time, observer and location. Section (B) titled preliminaries which contained data on the number of students enrolled and attended for the class based on gender. Section (C) titled observation items contained two (2) sub-sections viz: instructional resources where observer noted the available instructional resources presented by lecturer and students including the developed prototype, and classroom activities where lecturers and students activities are recorded accordingly. And Undergraduate Physics Students' Interview Protocol developed by the researcher and it consist of two (2) sections. Section (A) contained basic information of students such as; University code, gender, research group, time, interviewer and location. Section B titled Interview Questions (IQ) and will consist of ten (8) items

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on undergraduate University Physics students experience with DBL and how it affects their academic achievement, conceptual understanding, and learning burnout. The interview protocol and observation schedules were given to one professor, two senior lecturer from Science Education Department, Federal University of Technology Minna and One Associate Professor from Science Education Department, Kaduna State University for validation. Their corrections were considered in the construction of the final instruments. Introduction letter containing research objective, research question and research hypotheses were sent together with the instrument to assist in validating the instruments. The reliability of qualitative research instrument (Interview Protocol and Observation Schedule) were carried out using inter-rater reliability method. Two raters were assigned to rate the items of the instrument as to appropriate or not appropriate and the reliability index was calculated using Cohen's' Kappa reliability formula using $K = \frac{P_O - P_E}{1 - P_E}$. Where K is Cohens' Kappa, P_o represents the actual observed agreement and P_E represents agreement by chance. McHugh (2012) suggested that inter-rater reliability should be calculated using both percentage agreement and using Kappa formula so as to take care of guessing issue among the raters. The result for the Kappa Reliability Values obtained and raters' percentage agreement were found to 0.82 and 0.66 for the interview and observation schedule respectively

DBL Lesson Plan Models for four lesson were design to teach the group within four (4) weeks. Before the actual experiment started the researcher conducted a one day workshop for the pre-service teachers in experimental group on the features and practices involved in design-based learning. The treatment was done by the researcher and research assistant. The designed lesson model was strictly followed. However, an observation schedule designed by the researcher was strictly followed to observed pre-service teacher in DBL and how different DBL activities influence their academic achievement, conceptual understanding. Design-Based Learning Lesson Model and teachers/pre-service teachers' activities summary according to the phases are presented in Figure 2.

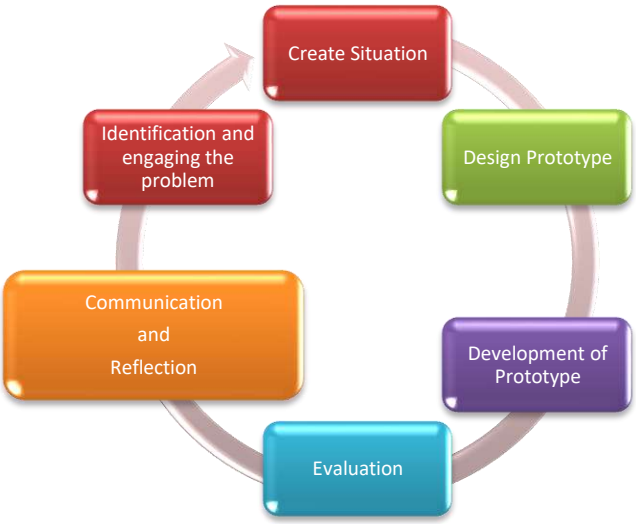

Figure 2: Design-Based Learning Lesson Model

Introduction: This is where teacher provides background explanation about the concept to be taught and group the students into small groups. Identification and engaging the problem: The teacher present an open-ended, real world problem scenario related to electromagnetism. Students here brainstorm, understand and define the problem, analyze the problem by breaking down the problem into smaller segment and students fill in "the need to know worksheet". Create situation: In this stage, the teacher provides knowledge explanation (concept and principle that will be applied), scaffold the generation of ideas through pictures, videos, textbooks, and links to Open Educational Resources and develop a plan and establish strategy while Students brainstorm and gather information by searching ideas in textbooks, Online, and other sources provided by the teacher individually and meet in a group to collaborate, generate an innovative idea to solve the identified problem and select and report the best idea. *Designing prototype:* The teacher provides design guidance, monitor the design process and provide appropriate scaffolds and Students here brainstorm, sketch and interpret design and select and report the best

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design. *Development of prototype*: The teacher monitor the construction process and provide appropriate guidance while students here convert the design into prototype, test the constructed prototype and report and document result. *Evaluation*: The teacher provides the evaluation question and worksheet. In this step, self-evaluation and group evaluation will be done by the students and they will answer the question as to whether the objective were achieved or not. *Communicate and Reflection*: The teacher moderates the presentation of the findings and scores the students using scoring rubric. Students share, and defend findings and argumentation. Immediately after the treatment, the researcher conduct an interview to explore pre-service teacher's experiences and feelings after exposure to design-based learning strategy. The interview will be recorded using recorder and transcribed thereafter. Simultaneous thematic procedure was employed to analyze the data collected. Data analysis through this procedure proceed hand in hand with data collection and write-up of findings (Creswell and Creswell, 2023). The data were winnowed focusing on some of the data and disregarding other part of it, this is because, the text and image data are so plentiful and therefore all the information cannot be used in the study (Guest *et al.,* 2012). The analysis of the data collected was done through a sequential process of organizing and preparing the data (transcribing, scanning materials, sorting and arranging), reading through the data, coding the data, identifying sub-themes (grouping the codes into sub-themes), identifying themes (grouping sub-themes into themes), developing a story line interpretation, adding analytical framework and interpreting the data.

Presentation of Results

The findings from interview and observation field notes revealed that students learning with DBL characterized by collaborative, engaging and student centered learning which could foster meaningful learning through the generation of idea, hands-on and minds-on activities, development of prototype and presentation of ideas which improved students' academic achievement, fostered conceptual understanding and reduced learning burn-out. These experiences with DBL are described by the students and are classified into four themes. Learning experiences, active participation, collaboration and reduced learning burn-out. These themes are explained below:

Learning Experiences

Increased in academic achievement and conceptual understanding are associated with positive learning experiences. Students' interview responses and observation field notes provide evidence that could be described as learning experiences. It was observed that students were excited and curious to learn through DBL. This showed that students were having positive interest and motivation and the theme was made up of sub-theme such as empowered learning, conceptual understanding, and enhanced achievement. These sub-themes are highlighted in a tabular form as presented in Table 1.

Table 1: Learning Experiences Theme, Sub-Themes, and their Definition

S/N	Themes	Sub-theme	Definitions
1	Learning experiences	Empowered learning	Refers to knowledge gain, self-assessment, positive interest and curiosity among learners. In this sub-theme, students reflect, taking control of their learning, and interact with each other.
		Conceptual understanding	Students demonstrate knowledge and deeper understanding of key concepts, principles, and theories and recognize relationships between them. It is characterized by deeper understanding and connection between concept/real-world applications.
		Enhanced achievement	Refers to mastery of subject matter knowledge and development of skills. In this sub-theme, students show progress and improvement in their academic performance.

Empowered learning

Knowledge gain, self-assessment, positive interest and curiosity among learners characterizes the DBL. Activities such as reflection, students taking control of their learning, and students interaction are classified under this sub-theme. This findings suggest that students gained more knowledge and remembered so many things they forgot before in electromagnetism as indicated in the students' excerpts presented below;

It doesn't affect me, but, like, it's helped me gain. Like, how will I even put it? I have experiences now.

(Participant A Interview, 19/09/2025)

I remember so many things that I forgot before, but during this experiment, or during this designing, I did remember a lot of things, and I learned so many things else.

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(Participant B Interview, 19/09/2025)

I am interested in this course, previously I have not acquired such skills. When the lecture was going on I was not exhausted because I am interested and that my attitude, skills and knowledge were improving

(Participant C Interview, 19/09/2025)

Students were observed working in team, sharing ideas, designing and constructing electromagnetic crane and electromagnet. Students were also seen happy as they took ownership of their project.

(Observation, 5/09/2025)

The verbal also indicated that students were excited, happy, comfortable and eagerly seeking for solution to different problems in electromagnetism. This affirmed that students have developed positive interest and showed increased in their curiosity to learn and find solution to problems in electromagnetism as indicated in the excerpt presented below;

Honestly, I enjoyed the iterative process of designing and testing my project. It helped me refine my ideas.

(Participant D Interview, 19/09/2025)

When learning or studying physics now I am eager and happy most a times.

(Participant D Interview, 19/09/2025)

I felt more comfortable during this process, I am happy and highly interested in the strategy

(Participant E Interview, 19/09/2025)

I felt very comfortable and learning with this method is interested. And I like the way we created that magnet. Sincerely it was interesting.

(Participant F Interview, 19/09/2025)

Actually, I felt happy, it's kind of the second time. I felt happy because it's kind of the second time me been designing a project, actually. I also like the way you teach us. You've been jovial, and I love the way you speak.

(Participant Interview, 19/09/2025)

A-I like the way our teacher used real example from our daily activities which made us think critically even outside the box, come up with the solution and develop a prototype of the solved problem

(Participant B Interview, 19/09/2025)

Students were observed constructing the electromagnet and electromagnetic crane and were seen laughing at the initial construction, they unpacked and constructed again trying to correct the initial mistake. They were seen sticking and re-sticking, measuring and cutting material (wood and wire) to the desired length.

(Observation, 12/09/2025)

Apart from students' excitement, happiness, comfort and eagerness to seeking for solution to different problems in electromagnetism, students had better experiences with DBL which led to an increase in their interest and fostered their skills. To support this findings, students' excerpts are presented below;

I felt better experience and happy. I experienced so many things that could improve my skills and enhance them and I sow so many things can be learnt experimentally. I am interested in this course, previously I have not acquired such skills. When the lecture was going on I was not exhausted because I am interested and that my attitude, skills and knowledge were improving

(Participant C Interview, 19/09/2025)

Throughout the process we work in group and the most interesting thing is that we had to share our work to class through presentation where we evaluate each other

(Participant G Interview, 19/09/2025)

Conceptual Understanding

Students demonstrate knowledge and understanding of key concepts, principles, and theories and recognize relationships between concepts, principles, and ideas. Students also apply conceptual understanding to real-world situations and demonstrate a deep understanding of concepts. It is characterized by deeper understanding and connection between concept/real-world applications. These findings suggest that students gained more conceptual knowledge in electromagnetism as indicated in the students' excerpts presented below;

Yes it increases my understanding of concept. Working in group assist me in getting a lot of views on electromagnetism. Members' responses help me gain more understanding.

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(Participant G Interview, 19/09/2025)

I mean like …..working on the design project helped me understand the concepts of electromagnetism more deeply. And feel like I am achieving my goals. I was less frustrated with learning electromagnetism after these lessons. I understood the concept better and felt more in control

(Participant D Interview, 19/09/2025)

The study's' findings also suggest that students have demonstrated knowledge on the integration of concepts during development of prototype to real world problem and this can be seen in the excerpts below;

We had to apply concepts from physics, mathematics and engineering to design and develop electromagnetic crane.

(Participant C Interview, 19/09/2025)

Year, I do understand more on facts, concept integration and procedures in solving problems associated with electric field and electric flux. I can also transfer my understanding to new situation.

(Participant B Interview, 19/09/2025)

Through the design process I get to understand more on how concept from different area are interconnected and how they can be used to solve real world problems.

(Participant G Interview, 19/09/2025)

Before now, I cannot differentiate between electric field and electric flux, but now I do.

(Participant Interview, 19/09/2025)

Enhanced Achievement

Students demonstrate mastery of subject matter knowledge and develop and refine skills. Students show progress and improvement in their academic performance in electromagnetism. Students have also demonstrated their ability to remember facts and concept, score better marks at test or exam and showed an increase in their skills level such as critical thinking, perseverance, communication and leadership. Activities such as coordinating group work, minds-on activities and presentation are classified under this sub-section. Findings suggest that students' academic achievement could be enhanced when learn using DBL as shown in the students' excerpts below;

It affects me positively because I have improved my learning performance. And I liked the way we conduct it and the performance is giving us very excellent. =

=Yes it increases my understanding of concept which help me score good marks at test

(Participant H Interview, 19/09/2025)

I remember so many things that I forgot before, but during this experiment, or during this designing, I did remember a lot of things, and I learned so many things else

(Participant E Interview, 19/09/2025)

I felt better experience and happy. I experienced so many things that could improve my skills and enhance them and I sow so many things can be learnt experimentally

(Participant C Interview, 19/09/2025)

The best way to solve the problem is working in team was what make me like this approach, this is because from ideas in my group we were able to proffer solutions. =

=We kept discussing till we reach consensus on the best idea=

=I mean I was appointed as group leader where I coordinated the activities of my group right from brainstorming up to the presentation of our developed prototype.

(Participant D Interview, 19/09/2025)

I played an important role while conducting the experiment, I have been the leader of the group.

(Participant H Interview, 19/09/2025)

The findings from the interview also revealed that students had increased in engagement through working in group as presented in the students' excerpts below;

I coordinated the activities of my group right from brainstorming up to the presentation of our developed prototype. We designed and developed electromagnet and throughout the process we work in group. =

=Hmmmm ……. The class was quite noisy, each group was busy discussing and defending their opinions, and everyone participated by sharing their points We were searching and reading books, information and ideas from the internet and others were jotting down information from the internet and textbooks.

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(Participant D Interview, 19/09/2025)

Well, it's kind of first time I learnt using design-based where we engaged with practical activities, we designed and developed electromagnet. We brainstorm and generated idea and solve the problem identified by our teacher.

(Participant B Interview, 19/09/2025)

It was observed that group leaders coordinated the activities of their group and the class was seen to be quite noisy, each group was busy discussing and defending their opinions.

(Observation, 12/09/2025)

Active Participation

Learners engaged in several activities during learning process using DBL. Activities such as hands-on activities, minds-on activities and searching for ideas from the internet and textbooks about electromagnetism are associated with this theme. Students' interaction and teacher-students interaction also characterize this theme. Students' interview responses and observation field notes provide evidence that could be described as active participation. This theme was made up of sub-theme such as engagement and classroom interaction. These sub-themes are highlighted in a tabular form as presented in Table 2.

Table 2: Active Participation Theme, Sub-Themes, and their Definition

S/N	Themes	Sub-theme	Definitions
2	Active Participation	engagement	Refers to the participation in design process through hands-on and minds-on activities.
		class interaction	Exchange of idea among students and between students and teacher with a view to achieving the learning objectives.

Engagement

The verbal and non-verbal data described students' engagement with activities such as iterative design process, communication and collaboration. Students were engaged in hands-on activities and minds-on activities. To support this findings, excerpt from students interview suggest that;

……. Where I coordinated the activities of my group right from brainstorming up to the presentation of our developed prototype

(Participant D Interview, 19/09/2025)

We designed and developed electromagnet and throughout the process we work in group.

(Participant G Interview, 19/09/2025)

Well, it's kind of first time I learnt using design-based where we engaged with practical activities, we designed and developed electromagnet

(Participant B Interview, 19/09/2025)

Yes, I help in designing and developing prototype.

(Participant A Interview, 19/09/2025)

Non-verbal data from observation field notes suggested that learners engage in hands-on activities with their group members to demonstrate how electric field and magnetic field are visualized.

The students were observed searching and reading their books while others were seen searching for relevant information and ideas from the internet. Some students were observed jotting down information from the internet and textbooks. Students are always excited to meet in a group to brainstorm and share ideas. Students are heard arguing and defending their ideas among group members

(Observation, 5/09/2025)

Non-verbal data suggest that students could be seen designing prototype before development and each group presented their work to the class.

(Observation, 12/09/2025)

The interview also indicated that students had participated actively as they engaged in minds-on activities where they brainstormed and generated ideas that led to the solution of problem as indicated in the students' excerpts below;

We brainstorm and generated idea and solve the problem identified by our teacher.

(Participant C Interview, 19/09/2025)

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We brainstorm and generated idea and solve the problem identified by our teacher.

(Participant G Interview, 19/09/2025)

A-I like the way our teacher used real example from our daily activities which made us think critically even outside the box, come up with the solution and develop a prototype of the solved problem

(Participant B Interview, 19/09/2025)

The students were observed sketching their ideas on how their electromagnetic crane or electromagnet should look like as indicated below

The students were observed constructing electromagnetic crane and electromagnet, engaging in group project based on the goal of solving the problem identified by the teacher.

The students seem to engage in co-construction of ideas during group interaction and discussion as indicated in the observation field notes. Students were also observed presenting several ideas, all the ideas were reviewed, and the best idea was adopted, or sometimes a new idea is developed from the ones presented.

(Observation, 5/09/2025)

Classroom Interaction

The finding shows that students were committed to their learning process, interact positively with each other, collaborate and interact with our teacher. The students work individually to search for relevant information and ideas and meet in a group to brainstorm and interact. This findings can be justified from the students' excerpt presented below;

We were searching and reading books, information and ideas from the internet and others were jotting down information from the internet and textbooks. =

=Hmmmm …. The class was quite noisy, each group was busy discussing and defending their opinions, and everyone participated by sharing their points

(Participant D Interview, 19/09/2025)

Our teacher initiated the lesson though real world example and guide us when doing the remaining process. =

= During group discussion, we try to figure out what will work best and what will not by identifying possible idea that best solve the problem.

(Participant G Interview, 19/09/2025)

His role was going round guiding us while we are solving the problem, and he played and social role, not standing just active always.

(Participant H Interview, 19/09/2025)

Our teacher gave us instructions and coach us when conducting the experiment.

(Participant C Interview, 19/09/2025)

We kept discussing till we reach consensus on the best idea.

(Participant G Interview, 19/09/2025)

During group discussion, students were observed presenting their ideas and justifying their position as other members of the group seek for clarity. Students were seen engaging in the reflection of what has been done in the previous phase.

Group Leader: any idea to be considered should meet the requirement necessary for solving the problem
Member 4: one of the condition is that the electromagnetic separator should have the strength to lift ferromagnetic materials with varying sizes and weights and that we can use local materials.
Member 2: we should use local resources like scraps metal
Member 3: knowledge of engineering is require to construct switch
Group leader: Any more contribution
Member 1: yes, we can use wood for the mechanical aspect and construct our crane
Member 4: let us know the material to be used please
Member 7: we need wood, connecting wires, and copper wire.
Member 5: good idea but we should use constantan wire
Member 5: no brother, I think this wire cannot give us the expected result, we should go for the first one (sales' proposal).
Member 3: let us look at the proposals
Member 5: After all the argument we have now come up with idea that is expected to work.

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(Observation, 5/09/2025).

Students were observed constructing the electromagnet and electromagnetic crane and were seen laughing at the initial construction, they unpacked and constructed again trying to correct the initial mistake. They were seen sticking and re-sticking, measuring and cutting material (wood and wire) to the desired length.

(Observation, 12/09/2025)

Verbal data also revealed that students work in team, present and share their work to the class, asked and answered questions and indicated confidence that they conducted the experiment themselves as shown in the students' excerpts below;

I also struggled with the design process, but my team helped me work through the challenges.

(Participant D Interview, 19/09/2025)

Throughout the process we work in group and the most interesting thing is that we had to share our work to class through presentation where we evaluate each other.

(Participant B Interview, 19/09/2025)

I'm not a group leader, but answered questions actually during presentation.

(Participant A Interview, 19/09/2025)

We did the experiment ourselves and the teacher was just going round to see how we were doing the activities

(Participant C Interview, 19/09/2025)

Discussion of Findings

Findings that revealed that undergraduate physics students experienced enhanced academic achievement that is characterized by mastery of subject matter knowledge, development of skills and improvement in academic performance. It was also affirmed from the study that DBL is characterized by students' active participation, hands-on and minds-on activities which could have contributed to students' empowered learning of physics. Students demonstrate mastery of subject matter knowledge, develop and refine skills. Students show progress and improvement in their academic performance in electromagnetism. Students have also demonstrated their ability to remember facts and concept, score better marks at test and exam and showed an increase in their skills level such as critical thinking, perseverance, communication and leadership. Students engage in activities such as coordinating group work, minds-on activities and presentation. Findings suggest that students' academic achievement could be enhanced when learn using DBL.

This findings concur with qualitative findings from Hanna *et al.,* (2025) whom conducted a study on monitoring multiple aspects of learning when design-based learning meets science education using qualitative approach and found that the teacher monitored diverse aspects of learning, namely students' chemical thinking, design practices, research practices, social interactions, ownership, behavior and emotions and how the teacher connected different aspects of learning which could support her interpretation of student learning and improve academic achievement. This qualitative findings also align with findings from Wei *et al.,* (2023) that carried out a study on the effectiveness of design-based engineering learning: the mediating role of cognitive engagement and the moderating role of modes of engagement whom found that all four features of DBEL (design practice, interactive reflection, knowledge integration, and circular iteration) were found to exert significant and positive effects on learning outcomes and that design-based learning approach can enhance engineering students' learning outcomes.

The positive result of this present study could be traced to the learning environment provided by the DBL through learning opportunities where students worked in group, understand and define problems, search for information/generate idea, engage in hands-on activities to visualize electric and magnetic field. This may have reduced students' misconceptions of electromagnetism. DBL hands-on approach enables students to develop critical thinking and problem-solving skills, leading to better academic achievement and interactive nature of DBL promotes deeper learning, increased motivation, and a sense of ownership, contributing to improved academic performance. In addition, DBL allows students to work at their own pace, receive feedback, and develop a more nuanced understanding of complex systems which fosters essential skills like communication, and collaboration thereby very vital for academic success. Another possible reason for the similar findings could be attributed to the fact that teachers serve as facilitators, providing guidance and support as needed, which can lead to more effective learning outcomes.

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The also revealed that conceptual understanding sub-theme emerged from the learning experiences theme where students demonstrate knowledge and understanding of key concepts, principles, and theories and recognize relationships between concepts, principles, and ideas. Students also apply conceptual understanding to real-world situations and demonstrate a deep understanding of concepts. These findings suggest that students gained more conceptual knowledge in electromagnetism. The study's' findings also revealed that students have demonstrated knowledge on the integration of concepts during development of prototype to real world problem where students applied concepts from physics, mathematics and engineering to design and develop electromagnetic crane, and electromagnet. The findings also indicated that students' higher-order thinking and higher-order capabilities are enhanced, such as critical thinking ability and problem-solving ability. At the same time, they are satisfied with the DBL instructional strategy. These findings suggest that the DBL approach is effective in promoting students' deep learning and improving the quality of teaching and learning.

This finding is in agreement with findings of Weng *et al.* (2023) whom found that the DBL approach is effective in promoting students' deep learning and improving the quality of teaching and learning and that DBL approach has distinctively stimulated the students' motivation to learn, making them more actively engaged in study. At the same time, they are satisfied with the DBL approach. The findings also concur with findings of Ladachart *et al.* (2022) orientation towards learning by making and testing and mindfulness of the process and impact on other people are the dimensions that facilitate conceptual learning on pulleys. In another similar study, Leung (2022) conducted a research on Developing a Framework for Blended Design-Based Learning in a First-Year Multidisciplinary Design Course. Quantitative results demonstrated increases in students' design competencies and intrinsic motivations leading to the emergence of four themes representing both positive and negative views of DBL.

On contrary to this study's' findings, Dognia and Dah (2023) found from their study that majority of the students had the misconception that gravity is selective and therefore acts more on heavier objects compared to lighter objects. As a result, they are of the opinion that larger object should hit the ground first before a light object dropped from the same height, which is not scientifically accurate and therefore reported that students are having misconceptions in physics. Mihret *et al.*, (2023) study also contradict the presents finding where the results of the one sample t-test showed that the conceptual understanding test scores for electricity and magnetism were considerably below the national standard pass mark points and the baseline for certification of competency to the teaching profession.

Conclusion

Undergraduate University physics students had positive learning experiences after exposed to DBL as revealed in the themes and sub-themes that emerged in this study. Students experienced empowered learning characterized by knowledge gain, self-assessment, positive interest and curiosity among learners. Students actively participated during learning with DBL as indicated in the second theme that emerged. And DBL could reduce or increase learning burn-out as indicated in the third theme that emerged with three sub-theme: reduced physics students emotional exhaustion, increased students efficacy as they showed confidence and ability to achieve goal and overcome challenges and student experienced challenges during learning with DBL as some students had difficulty in construction and concentration, frustrated and stressed.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. Incorporate design-based learning strategy element such as real-world examples, prototyping, and collaboration to illustrate physics concepts particularly electromagnetism, making the subject more relevant and engaging for students as it leads to higher academic achievement compared to lecture method.
2. Lecturers should provide equal access and opportunities for all students when learning through DBL as it is effective for both male and female students in terms of academic achievement
3. Facilitators should use the same instructional strategy (DBL or lecture method) for both male and female students as the effectiveness does not depend on gender. This was confirmed by non-interaction effect between methods and gender on academic achievement and conceptual understanding in electromagnetism.

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4. Lecturers should encourage collaborative learning and teamwork to promote social interaction, communication, and problem-solving skills since DBL was found to improve conceptual understanding of physics students in electromagnetism, as it outperforms traditional lecture methods.
5. Curriculum developers should integrate design-based learning principles and strategies into the undergraduate physics curriculum to promote conceptual understanding as DBL is equally effective for both male and female physics undergraduate students in promoting conceptual understanding.
6. University management should mandate the implementation of DBL in teaching physics to reduce learning burn-out, as it leads to lower burn-out compared to lecture methods.

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Comparative Assessment of Teachers' Gender Bias and Classroom Participation Patterns among Adolescents in Public Secondary Schools in Lagos State, Nigeria

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Abstract
This study examined the influence of teachers' gender bias on classroom participation patterns among adolescents in public secondary schools in Lagos State, Nigeria. Using a descriptive correlational survey design, a total of 480 students (240 males and 240 females) and 48 teachers were selected through multistage sampling from eight public secondary schools. Data were collected using a Teachers' Gender Bias Questionnaire, a Classroom Participation Scale, and structured classroom observations, and were analysed using descriptive statistics, independent samples t-tests, and Pearson correlation, complemented by qualitative thematic analysis. Findings revealed that teachers exhibited multiple forms of gender bias, including calling on boys more frequently, assigning cognitively demanding tasks to male students, and praising girls primarily for compliance or neatness. Male students participated significantly more than female students in classroom activities, while female students often self-censored or participated indirectly. A strong positive correlation was found between teachers' gender bias and boys' participation, and a strong negative correlation with girls' participation. Qualitative data further highlighted how classroom interactions reinforced gendered expectations and shaped students' confidence and engagement. The study concludes that teachers' gendered practices significantly influence adolescents' classroom participation, perpetuating gender hierarchies, and recommends targeted teacher training, inclusive classroom strategies, and policy interventions to promote equitable participation.

Keywords: Teachers' Gender Bias, Classroom Participation, Adolescents, Public Secondary Schools, Gender Equity

Introduction
The classroom constitutes a central social arena in which norms, identities, and power relations are continuously produced and reproduced through everyday interactions. Within the sociology of education, teaching is understood not merely as the transmission of curricular knowledge but as a deeply social process through which values, expectations, and social hierarchies are communicated to learners. Teachers function as key agents of socialization whose beliefs, expectations, and interactional styles can either promote equity or reinforce existing inequalities. A growing body of international research demonstrates that teachers may unconsciously display gender bias through subtle practices such as differential questioning, varied feedback patterns, uneven disciplinary responses, and unequal distribution of instructional attention, all of which shape students' opportunities to participate meaningfully in classroom activities (Sadker & Zittleman, 2016; Francis, Skelton, & Read, 2020; UNESCO, 2023). These interactional practices often appear neutral on the surface but cumulatively influence how male and female students perceive their abilities, voice, and legitimacy within the learning environment. In Nigerian, scholarly and policy discussions on gender inequality in education have largely focused on issues of access, enrolment, retention, and completion rates, particularly for girls. While these macro-level indicators are important, they provide limited insight into the everyday classroom processes through which gendered educational experiences are produced. Micro-level dynamics, such as teacher-student interactions and participation patterns, remain underexplored despite their significant implications for learning and identity formation. This gap is particularly evident in urban megacities such as Lagos State, which is often portrayed as socially progressive due to its cosmopolitan character and relatively high educational indicators. Recent studies, however, suggest that deeply embedded gender norms continue to shape classroom interactions in Nigerian urban schools, influencing how teachers perceive students' competence, confidence, and leadership potential across gender lines (Aina & Cameron, 2019; Ogunyemi & Akinbode, 2021). In mixed-

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gender classrooms, these assumptions can manifest in systematic differences in who speaks, who is encouraged, and whose contributions are validated.

Classroom participation, expressed through activities such as asking questions, responding to teachers, engaging in discussions, and taking on leadership roles, is a crucial mechanism through which students develop academic confidence, communicative competence, and future aspirations. During adolescence, participation takes on heightened importance as students negotiate identity, self-worth, and social positioning within peer and institutional contexts. Sociological research indicates that unequal participation opportunities can have lasting consequences, shaping students' academic trajectories, subject choices, and perceptions of education as a pathway to social mobility (Leaper & Brown, 2018; Connell, Pearse, Collyer, Maia, & Morrell, 2023). This study seeks to examine how such bias influences participation patterns among male and female adolescents in public secondary schools in Lagos State by situating teachers' gender bias within everyday classroom practices, thereby contributing to a more nuanced sociological understanding of gender and schooling in Nigeria.

Despite national and state-level policy commitments to gender equality and inclusive education in Nigeria, classroom-level practices often remain sites where subtle but persistent forms of gender differentiation are enacted. Educational policies emphasize equal treatment and participation for all learners, yet research across African contexts indicates that teachers may interact differently with students based on gender, often without conscious intent. Empirical studies have shown that male students are more frequently called upon to answer questions, allowed greater latitude in assertive or disruptive behaviour, and encouraged to engage in cognitively demanding tasks, while female students are more likely to receive praise for compliance, neatness, or silence (Unterhalter et al., 2019; Dunne, Humphreys, and Leach, 2021; Ajayi & Salami, 2022). Such patterns contribute to unequal classroom experiences that can marginalize students, suppress active participation, and reinforce traditional gender roles related to authority, voice, and intellectual competence.

In Lagos State public secondary schools, these challenges may be intensified by structural conditions such as overcrowded classrooms, high student-teacher ratios, and heavy teacher workloads. Under such conditions, teachers may rely on habitual interactional patterns and culturally familiar gender norms to manage classrooms efficiently, inadvertently reproducing gender bias in participation opportunities. Adolescents who experience consistent exclusion or limited encouragement may internalize perceptions of low academic ability or reduced entitlement to speak, with potential long-term consequences for engagement and achievement. Despite the relevance of these issues, there remains a lack of systematic empirical evidence examining how teachers' gender bias directly influences classroom participation patterns among adolescents in Lagos State. This gap limits scholarly understanding of the social dynamics of schooling and constrains the development of effective gender-responsive teacher training and pedagogical reforms. The present study addresses this problem by empirically investigating the relationship between teachers' gender bias and classroom participation patterns among male and female adolescents in public secondary schools, with the aim of informing both sociological theory and educational practice.

Objectives of the Study

The general objective of the study is to examine the influence of teachers' gender bias on classroom participation patterns among adolescents in public secondary schools in Lagos State.

Specific objectives are to:

1. Identify forms of teachers' gender bias manifested during classroom interactions.
2. Examine gender differences in classroom participation patterns among adolescents.
3. Determine the relationship between teachers' gender bias and students' classroom participation.

Research Questions

1. What forms of gender bias are exhibited by teachers during classroom interactions?
2. How do classroom participation patterns differ between male and female adolescents?
3. What relationship exists between teachers' gender bias and students' classroom participation?

Theoretical framework

The study is grounded in Bourdieu's Theory of Cultural Reproduction, which conceptualizes schools as social institutions that contribute to the maintenance of existing social inequalities through everyday pedagogical practices and symbolic

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power. According to Bourdieu, teachers operate as cultural arbiters whose expectations, evaluative criteria, and interactional styles often align with dominant social norms, thereby privileging certain dispositions and behaviours while devaluing others (Bourdieu & Passeron, 1990). Within classroom contexts, gendered expectations are embedded in what is recognized as appropriate participation, confidence, and intellectual competence. These expectations, though rarely explicit, shape students' access to teacher attention and opportunities to speak, leading to differential accumulation of cultural capital among male and female students (Reay, 2018). As a result, classroom participation becomes a mechanism through which gendered inequalities are subtly reproduced under the guise of merit and neutrality.

Feminist interactionist theory complements this structural perspective by focusing on micro-level social interactions through which gender is actively constructed and sustained in everyday settings. Drawing from symbolic interactionism, feminist scholars argue that gender is accomplished through routine interactions, language use, and institutional practices, including those found in classrooms (West & Zimmerman, 1987; Francis et al., 2020). In educational settings, teacher–student interactions such as turn allocation, feedback, praise, and disciplinary responses serve as sites where gender norms are reinforced or contested. These interactional processes shape how adolescents come to understand their own abilities, voice, and legitimacy as classroom participants, often positioning assertiveness and leadership as masculine while encouraging compliance and passivity among female students (Dunne et al., 2021). Taken together, Bourdieu's Theory of Cultural Reproduction and feminist interactionist theory provide a robust analytical lens for understanding how gendered inequalities in classroom participation are produced and sustained. While Bourdieu's framework highlights the structural and symbolic dimensions of inequality embedded in schooling, feminist interactionism illuminates the everyday practices through which these structures are enacted and internalized. The integration of these theories allows this study to explain how teachers' routine classroom practices can privilege particular gendered behaviours while marginalizing others, thereby shaping adolescents' participation patterns and self-concept within public secondary schools (Connell et al., 2023; Reay, 2018).

Methodology

The study adopted a descriptive correlational survey design to examine the influence of teachers' gender bias on classroom participation patterns among adolescents in public secondary schools in Lagos State. The population of the study consisted of all teachers and students in public secondary schools across the six education districts in Lagos State. A multistage sampling technique was used. First, three education districts were randomly selected. Second, eight public secondary schools were selected through stratified sampling to ensure representation of junior and senior secondary levels. From the selected schools, a total sample of 480 adolescents comprising 240 male and 240 female students was drawn using simple random sampling, alongside 48 teachers who were purposively selected based on active classroom teaching roles. This sample size was considered adequate for statistical analysis and for capturing gender-based interactional patterns within classrooms. Data were collected using three instruments: a Teachers' Gender Bias Questionnaire, a Classroom Participation Scale for students, and a structured classroom observation checklist to identify observable forms of gender bias during instructional interactions. The instruments were validated by experts in sociology of education and educational measurement, and reliability coefficients ranging from 0.76 to 0.88 were obtained using Cronbach's alpha. Data analysis was conducted using descriptive statistics to identify forms of gender bias and participation patterns, while independent samples t-tests were used to examine gender differences in classroom participation. Pearson product–moment correlation analysis was employed to determine the relationship between teachers' gender bias and students' classroom participation. All analyses were conducted at the 0.05 level of significance, ensuring that the methodological procedures aligned with the study's objectives and research questions.

Presentation of Results

The following are the findings of the study guided by the research questions:

Quantitative Phase

Research Question 1: Forms of Gender Bias Exhibited by Teachers

Data from the Teachers' Gender Bias Questionnaire and classroom observations revealed several forms of gender bias among teachers in Lagos State public secondary schools. Table 1 presents the frequency and percentage of observed forms of bias.

Table 1: Forms of Gender Bias Exhibited by Teachers

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Form of Gender Bias	Frequency (f)	Percentage (%)
Calling on boys more frequently than girls	38	79.2
Giving more challenging tasks to boys	35	72.9
Praising girls primarily for neatness and compliance	32	66.7
Tolerating assertive behaviour in boys more than girls	30	62.5
Interrupting girls more than boys	28	58.3

From the table, the most common form of gender bias was calling on boys more frequently than girls (79.2%), followed by assigning cognitively demanding tasks to boys (72.9%). Observational data corroborated these findings, showing that boys were more often invited to answer questions, while girls' contributions were frequently overlooked or ignored. Teachers also tended to praise girls for compliance and neatness rather than intellectual engagement, reinforcing gendered expectations.

Research Question 2: Gender Differences in Classroom Participation

Classroom participation patterns were analysed using independent samples t-tests comparing male and female students' engagement in asking questions, responding to teachers, and participating in discussions. Table 2 shows the mean scores and statistical comparison.

Table 2: Gender Differences in Classroom Participation

Participation Dimension	Male (n = 240) Mean (SD)	Female (n = 240) Mean (SD)	t-value	p-value
Asking questions	4.21 (0.85)	3.12 (0.79)	11.24	0.001
Responding to teachers	4.08 (0.81)	3.28 (0.75)	9.57	0.001
Engaging in discussions	3.95 (0.90)	3.20 (0.82)	8.43	0.001

The results indicated that male students participated significantly more than female students across all measured dimensions of classroom participation ($p < 0.05$). The largest difference was observed in the frequency of asking questions, suggesting that boys were more confident or encouraged to contribute verbally during classroom interactions. Female students' participation appeared constrained by both teacher behaviour and classroom norms.

Research Question 3: Relationship Between Teachers' Gender Bias and Students' Classroom Participation

Pearson correlation analysis was conducted to determine the relationship between teachers' gender bias scores and students' classroom participation scores. Table 3 summarizes the findings.

Table 3: Correlation Between Teachers' Gender Bias and Classroom Participation

Variables	r	p-value	Interpretation
Teachers' Gender Bias – Male Participation	0.62	0.001	Strong positive correlation
Teachers' Gender Bias – Female Participation	-0.57	0.001	Strong negative correlation

The analysis revealed a strong positive correlation between teachers' gender bias and male students' participation, indicating that higher levels of bias favouring boys were associated with greater engagement by male students. Conversely, there was a strong negative correlation between teachers' gender bias and female students' participation, suggesting that gender-biased teacher behaviour inhibited girls' classroom involvement. These findings underscore the direct influence of teacher interactional practices on adolescent participation patterns.

Qualitative Results

Forms of Gender Bias Exhibited by Teachers

Classroom observations and interviews revealed nuanced ways in which teachers' gender bias manifested during instructional interactions. Teachers were observed to call on male students more frequently when asking questions or assigning leadership roles during group activities. One teacher was noted telling a male student, "You can handle this; I trust your answer," while overlooking a female student who had raised her hand multiple times. In interviews, several female students described experiences of being ignored despite signalling readiness to answer. One student stated, "Even when I know the answer, the teacher usually picks a boy first. Sometimes I feel like they think girls are quieter and less capable." These narratives aligned with observation data showing that teachers often praised boys for intellectual contributions but praised girls for neatness or compliance rather than critical thinking. Another recurring theme was the assignment of more cognitively demanding tasks to boys. During science and mathematics lessons, boys were consistently asked to solve complex problems on the board, whereas girls were given simpler or less visible tasks. Teachers also tended to tolerate assertive or disruptive behaviour from boys more than girls. One observed lesson showed a male student

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interrupting the teacher multiple times to answer questions, receiving encouragement, while a female student exhibiting similar assertiveness was gently admonished for "speaking out of turn." Female students described this as discouraging, noting that it reduced their willingness to participate actively in future lessons.

Gender Differences in Classroom Participation Patterns

Qualitative findings from student interviews supported the quantitative results showing higher male participation. Many male students expressed confidence in answering questions and engaging in discussions, often citing teacher encouragement as a motivator. One male student commented, "The teacher usually asks us to explain our ideas. Boys get more attention, so we feel more confident speaking." Female students, by contrast, reported hesitation and self-censoring behaviour. A female student noted, "I don't raise my hand as often because I know the teacher might not call on me, and it is embarrassing when boys answer first." Focus group discussions revealed that girls often participated indirectly, such as whispering answers to peers or writing answers in notebooks, rather than speaking aloud in class. These strategies were interpreted as adaptive responses to perceived teacher bias and classroom norms, highlighting how structural and interactional factors intersect to shape participation patterns. Observations confirmed that when teachers made explicit efforts to call on girls, their engagement improved, suggesting that teacher behaviour was a critical determinant of participation levels.

Relationship Between Teachers' Gender Bias and Classroom Participation

Qualitative data further illuminated the correlation between teacher behaviour and student engagement. Interviews revealed that boys were aware of preferential treatment, with some expressing pride and motivation to participate. One male student stated, "I like when the teacher calls on me more. It makes me want to answer even more." Girls, however, expressed frustration and a sense of marginalization. One commented, "Sometimes I feel invisible in class. Even when I try, the teacher does not notice me like the boys." Teachers themselves acknowledged, in informal interviews, that they tended to subconsciously call on boys more often, citing perceptions that boys were "more confident" or "better at thinking on their feet." These qualitative insights reinforced the quantitative correlations found in the study. They illustrated not only that teachers' gender bias favoured boys and inhibited girls, but also how adolescents internalized these patterns, shaping their classroom behaviours and self-concept. Students' narratives and classroom interactions highlighted that participation was not solely determined by individual confidence or ability, but was significantly influenced by teacher expectations and the classroom environment.

Summary of Findings

The study found that teachers in public secondary schools in Lagos State exhibited multiple forms of gender bias, including calling on boys more frequently, assigning them more challenging tasks, and praising girls primarily for compliance or neatness. Quantitative results showed that male students participated significantly more than female students in classroom activities such as asking questions, responding to teachers, and engaging in discussions, while qualitative data revealed that girls often self-censored or participated indirectly due to perceptions of teacher favouritism toward boys. Correlation analyses indicated a strong positive relationship between teachers' gender bias and boys' participation and a strong negative relationship with girls' participation, highlighting that teacher behaviour directly shaped classroom engagement patterns. Overall, the findings demonstrate that teachers' gendered expectations and interactional practices significantly influenced adolescents' participation, reinforcing gendered hierarchies and affecting students' confidence and classroom visibility.

Discussion of Findings

The findings of this study revealed that teachers in Lagos State public secondary schools exhibited multiple forms of gender bias during classroom interactions, which significantly influenced adolescents' participation patterns. Quantitative and qualitative evidence showed that boys were called upon more frequently, assigned more cognitively demanding tasks, and encouraged to engage assertively in classroom discussions, while girls were more often praised for compliance, neatness, and passivity. This pattern aligns with existing literature that highlights the persistence of gendered expectations in schools, where teachers, often unconsciously, reproduce societal norms that privilege male students in participation and recognition (Sadker & Zittleman, 2016; Francis, Skelton, & Read, 2020). Observations from this study also corroborate findings by Ajayi and Salami (2022), who noted that Nigerian teachers tend to favor male students in classroom interactions, resulting in disproportionate learning opportunities and reinforcement of gendered self-perceptions. The qualitative data further demonstrated that girls often resorted to indirect participation strategies, such as whispering answers to peers or writing

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responses in notebooks, reflecting adaptive behaviours in response to perceived teacher bias. This supports Reay's (2018) argument that structural and symbolic forms of power in classrooms shape student behaviour, with marginalized groups adjusting their actions to navigate unequal learning environments.

The significant gender differences in classroom participation identified in this study are consistent with international research demonstrating that male students generally exhibit higher engagement in verbal and interactive classroom activities when teacher practices are biased (Leaper & Brown, 2018; Connell, Pearse, Collyer, Maia, & Morrell, 2023). In this study, boys consistently demonstrated higher frequencies of asking questions, responding to teachers, and participating in discussions, while girls displayed more reserved behaviour, often refraining from verbal contributions due to fear of being ignored or interrupted. These patterns illustrate how teacher expectations and classroom management strategies directly influence student confidence and engagement, echoing findings from Dunne, Humphreys, and Leach (2021), who reported that gendered teacher behaviours in sub-Saharan African schools perpetuate inequality by creating an environment that implicitly favours boys' assertiveness and discourages girls' vocal participation. Furthermore, the strong positive correlation between teacher bias and boys' participation, alongside the negative correlation with girls' participation, emphasizes the critical role of teacher behaviour in shaping classroom dynamics, reinforcing earlier assertions by Unterhalter et al. (2019) that gendered educational practices contribute to long-term disparities in skill development and self-efficacy among students. The findings of this study can be theoretically interpreted through the combined lenses of Bourdieu's Theory of Cultural Reproduction and feminist interactionist perspectives. Bourdieu (1990) posited that schools function as sites for the reproduction of social hierarchies, with teachers acting as cultural arbiters who reward behaviours aligned with dominant social norms, including gendered expectations. In the context of this study, teachers' preferential treatment of boys and differential feedback mechanisms can be seen as forms of symbolic power that reinforce traditional gender roles and limit the accumulation of cultural capital for female students. Feminist interactionist theory further illuminates the micro-level processes through which these biases are enacted and internalized. The study's qualitative findings revealed that daily interactions, language use, and subtle reinforcement of gender norms shaped girls' self-perception and willingness to participate, highlighting the performative and socially constructed nature of gender in classrooms (West & Zimmerman, 1987; Francis et al., 2020). Together, these theoretical perspectives suggest that gendered participation patterns are not solely the result of individual student characteristics but are deeply embedded in classroom structures, teacher expectations, and interactional practices, which collectively sustain gender inequalities in education.

Conclusion

The study established that teachers in public secondary schools in Lagos State exhibited multiple forms of gender bias, including preferentially calling on boys, assigning them more challenging tasks, and praising girls primarily for compliance or neatness. These behaviours significantly influenced classroom participation patterns, with male students demonstrating higher levels of engagement in asking questions, responding to teachers, and participating in discussions, while female students often self-censored or participated indirectly. The findings revealed a strong positive relationship between teachers' gender bias and boys' participation and a strong negative relationship with girls' participation, highlighting the direct impact of teacher behaviour on adolescents' classroom engagement. The study confirmed that gendered expectations and interactional practices in the classroom reinforce traditional hierarchies and affect students' confidence, self-concept, and opportunities to acquire cultural capital, consistent with Bourdieu's Theory of Cultural Reproduction and feminist interactionist perspectives. Overall, the study demonstrated that classroom-level gender dynamics play a crucial role in shaping educational experiences and outcomes for adolescents.

Recommendations

Based on the findings, the study makes the following recommendations:

1. Education authorities should implement regular gender-sensitivity training for teachers to raise awareness of unconscious biases and promote equitable classroom practices that encourage participation from all students.
2. Teachers should deliberately adopt strategies such as equitable turn-taking, varied task allocation, and recognition of diverse contributions to ensure that girls and boys have equal opportunities to participate actively in lessons.
3. Lagos State Ministry of Education should develop policies and monitoring frameworks to evaluate classroom interactions, ensuring that gender equity is embedded in teaching standards and school inspections.

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Assessment of Banditry Activities on Teachers' Commitment and Provision of Instructional Materials for Effective Curriculum Implementation among Upper Basic Schools in North-West, Nigeria

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Abstract

This research assessed banditry activities on teachers' Commitment and provision of instructional materials for effective curriculum implementation among upper basic Schools in North-West, Nigeria The study was guided by two specific objectives, two research questions and two hypotheses, respectively. The Descriptive survey design was adopted for the study. The population of the study was 1,265,457 comprising 36,939 teachers, 1, 206, 963 students and 21,555 Quality Assurance Officials. Three hundred and eighty-four (384) respondents were randomly sampled to represent the total population. Questionnaire was employed to collect data. Pilot test was conducted and a Reliability coefficient of 0.819 was obtained. Mean scores and Standard Deviation were used to answer the research questions while Kruskal-Wallis H test was used to test the null hypotheses. The findings of the study revealed that banditry had a significant negative impact on teachers' commitment to curriculum implementation and provision of instructional materials. The study concluded that Banditry had caused a shortage and absence of teachers this led to poor academic performance of students and the production of half-baked graduates who lacked the skills to contribute meaningfully to National Development. The study recommended among others that Government and education authorities should provide special security measures for teachers working in banditry-prone areas, including school security personnel, surveillance systems, and safe transportation.

Keywords: Banditry, Teachers' commitment, Instructional materials, Upper Basic Schools

Introduction

Education is a fundamental instrument for human capital development, social integration, and national progress. At the upper basic school level, effective curriculum implementation is crucial, as it forms the foundation for learners' academic advancement, skills acquisition, and civic development. Successful curriculum implementation largely depends on teachers' commitment and the availability of adequate instructional materials. Teachers' commitment manifested through regular attendance, punctuality, lesson preparation, effective teaching, and sustained engagement with learners plays a central role in translating curriculum objectives into meaningful learning experiences. Similarly, instructional materials such as textbooks, charts, laboratory equipment, audio-visual aids, and information and communication technology (ICT) resources enhance teaching effectiveness and promote learners' understanding of curriculum contents (Federal Republic of Nigeria [FRN], 2014). However, the realization of these educational goals has been increasingly threatened by rising insecurity in Nigeria, particularly banditry in the North-West geopolitical zone. Banditry, characterized by armed attacks, kidnappings, killings, cattle rustling, and destruction of property, has become one of the most persistent security challenges in the region. States such as Zamfara, Katsina, Kaduna, Kebbi, and Sokoto have experienced frequent attacks, many of which directly or indirectly target schools, teachers, and students. This has created an atmosphere of fear and uncertainty that disrupts normal school operations and undermines the stability of the education system (Kanu et al., 2025; UNICEF Nigeria, 2025). Empirical evidence indicates that insecurity significantly affects teachers' commitment to their professional responsibilities. In banditry-prone areas, teachers often face threats to their personal safety, leading to absenteeism, irregular school attendance, psychological stress, and in some cases, voluntary transfers or resignation from service. Studies have shown that persistent violence discourages teachers from accepting postings to insecure areas and weakens their motivation to deliver curriculum content effectively (Abdulsalam et al., 2025; Nathaniel & Imrana, 2025). Consequently, students in affected schools experience disrupted learning schedules, poor teacher–student interaction, and inadequate

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curriculum coverage. In addition to its impact on teachers, banditry has adversely affected the provision and utilization of instructional materials in upper basic schools. Repeated attacks on communities and school facilities often result in the destruction, theft, or abandonment of instructional resources. Insecurity also discourages government agencies, school administrators, contractors, and development partners from supplying, maintaining, or monitoring instructional materials in volatile areas. As a result, many schools operate with insufficient or obsolete teaching materials, thereby limiting teachers' ability to implement the curriculum effectively (Oladoyin et al., 2024). The absence or inadequacy of instructional materials further compounds the challenges posed by low teacher commitment, leading to poor learning outcomes and declining educational quality.

Despite growing scholarly attention to the effects of insecurity on education in Nigeria, much of the existing literature focuses broadly on school enrolment, attendance, or infrastructure damage. There remains limited empirical emphasis on how banditry specifically affects teachers' commitment and the provision of instructional materials as key determinants of curriculum implementation at the upper basic school level in North-West Nigeria. Addressing this gap is essential for generating evidence-based insights that can inform educational policy, improve teacher support mechanisms, and enhance the provision of instructional resources in conflict-affected areas. Theories and Models are useful in programme assessment because they provide a set of steps that could be followed in carrying out a proposed assessment, they are very important in the understanding of concepts used in education, they are carefully selected in line with the topic. Therefore, the researcher reviews the theory of Queer Ladder Theory (QLT). The origin of Queer Ladder Theory was associated with an American Sociologist, Daniel Bell (1919-2011), who coined the idea of 'Queer Ladder' in an attempt to explain the instrumental essence of organized crime as a desperate means of socio-economic empowerment and social climbing. Applied to the context of this study, Queer Ladder Theory enables one to come to terms with the prevalence of organized crimes in Northwest, Nigeria. In this regard, it is observed that the phenomenon of banditry in Northwest; Nigeria has been driven by criminal quest for economic accumulation in an environment. Also, the Frustration-Aggression Theory was reviewed by the researchers. Theory was propounded by Fererabend and Feirauben (1972) and captured in a monograph by five scholars in Yale Institute of Human Relations in 1939. The major assumption of the model is that aggression is always a consequence of frustration and that the occurrence of aggressive behaviour always presupposes the existence of frustration and contrary wise that the existence of frustration always leads to some form of aggression (Dollard, Miller, Doob, Mower, & Sears, 1939; Feierabend & Feierabend, 1972). Thus, Miller (1941) noted that it was too general to assume that frustration must always lead to aggression or that aggression is always propelled by frustration. His intervention led to the second lap of the hypothesis which reflected a more acceptable reality that frustration produces instigations to a number of different types of response, one of which is instigation to some form of aggression. Different research works have been conducted on banditry, most of which reviewed by the researchers have been found conducted in Nigeria. Among are those conducted and reviewed by the researcher are; Oladunjoye and Omemu (2014) examined the effect of Boko Haram on school attendance in Northern Nigeria, Abdulrasheed, Onuselogu, and Uzoechina (2015) examined the effect of insurgency on Universal Basic Education in Bornu State of Nigeria, also Lawal (2015) analysed the nature and consequences of armed banditry in Nigeria: A case study of Sokoto, Kebbi, Zamfara and Katsina States, among others. This present study assessed the impact of banditry on teachers' commitment and provision of instructional materials on the curriculum implementation of upper basic schools in North-West, Nigeria.

Statement of the Problem

Effective curriculum implementation in upper basic schools depends substantially on both teachers' commitment and the availability of instructional materials. Teachers' commitment involves regular attendance, lesson preparation, punctuality, and active engagement in instructional duties, while instructional materials such as textbooks, visual aids, laboratory resources, and teaching technologies support pedagogical delivery and influence students' learning outcomes. However, in Northwest Nigeria, persistent banditry characterized by armed attacks, kidnappings, and threats to life and property has disrupted educational processes, undermining both human and material resources critical for curriculum implementation. Reports indicate that ongoing insecurity has led to frequent school closures, reduced school attendance, and the withdrawal of students and teachers in affected communities, creating an atmosphere of fear that compromises teachers' ability to fulfil their professional roles (Reuters, 2026). In parts of the region, such as Zamfara State, insecurity has forced teachers to cease attending school regularly due to fear of attack, thereby diminishing their commitment to instructional responsibilities

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and disrupting normal teaching and learning routines (The Cable, 2024). Moreover, banditry and school attacks have been shown to disrupt the provision of learning environments and resources, as physical assaults on school infrastructure and inventories reduce the availability and quality of instructional materials necessary for effective teaching (UNICEF Nigeria, 2025). Although research on insecurity and education often highlights school closures and enrolment decline, there remains a limited empirical focus specifically on how banditry affects teachers' commitment and the provision of instructional materials for curriculum implementation in upper basic schools in Northwest Nigeria. This gap constrains educational stakeholders' ability to develop evidence-based interventions to address both human resource challenges and material deficits arising from insecurity. Therefore, this study seeks to fill this gap by examining the impacts of banditry on teachers' commitment and the availability of instructional materials, with the aim of informing policy responses that can enhance curriculum implementation in conflict-affected education settings.

Objectives of the Study

The objectives of this study are to:

1. Examine the impact of banditry activities on teachers' commitment in curriculum implementation in Upper Basic Schools in Northwest, Nigeria;
2. Assess the impact of banditry activities on provision of instructional materials for curriculum implementation in Upper Basic Schools in Northwest, Nigeria.

Research Questions

The followings constitute research questions of this study:

1. What is the impact of banditry activities on teachers' commitment in curriculum implementation in Upper Basic Schools in Northwest, Nigeria?
2. To what extent has banditry activities impacted on the provision of instructional materials for curriculum implementation in Upper Basic Schools in Northwest, Nigeria?

Hypotheses

Following hypotheses were tested at 0.05 level of significance:

H_{O1}: Banditry activities has no significant impact on teachers' commitment in curriculum implementation in Upper Basic Schools in Northwest, Nigeria.

H_{O2}: Banditry activities has no significant impact on the provision of instructional materials for curriculum implementation in Upper Basic Schools in Northwest, Nigeria.

Methodology

Descriptive survey design was used for this study. The design requires the administration of appropriate instrument to a large audience of respondents within a specified period of time. This design was chosen because it has the advantage of producing good responses from the wide range of people. Accurate description is important in making wide range of policy decisions. Descriptive Survey design generally deals with current phenomenon spread over a wide area for the purpose of getting clearer understanding, control and subsequent investigation. The choice of descriptive survey design for this research was based on the fact that the entire population cannot be covered, and so a sampling procedure would be done. The population of the study was 1,265,457 which comprised of teachers, students and Quality Assurance Officials in Upper Basic Schools in Seven North West States of Jigawa, Kaduna, Kano, Katsina, Kebbi, Sokoto and Zamfara. The number of Upper Basic Schools teachers, students and Quality Assurance Officials was 36,939, 1,206,963 and 21,555 respectively totalling 1,265,457 in North West, Nigeria (UBEC 2023, Basic Education Data and Indicator profile: Facts and Figure in Nigeria). A sample size of 384 participated in the study. This is based on the recommendation by the Research Advisors (2006), which recommends that for a population of 1,265,457 a sample size of 384 is sufficient for generalization at 95% confidential level and 5% margin of error. Purposive sampling technique was used to select Upper Basic Schools in Kaduna, Katsina and Zamfara States. These three states were purposely selected because of their vulnerability to excessive banditry attacks. The accessible population was made of teachers, students, and Quality Assurance Officials in three schools each of Kaduna, Katsina and Zamfara States. The schools were selected using purposive sampling technique because they were in time past subjected to attacks by bandits. Accidental sampling technique was used to select teachers and Quality Assurance Officials because of their personality while simple random sampling technique was used to select students. Research data was gathered through self-structured questionnaire tagged Assessment of the Impact of Banditry

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on Curriculum Implementation Questionnaire (AIBCIQ). The questionnaire was designed bearing in mind the Research objectives, Research questions and Hypotheses of the study. It was distributed to respondents which comprised of Students, Teachers and Quality Assurance Officials in the study area. The instrument was divided into two sections. Section A assessed the impact of banditry on teachers' commitment to curriculum implementation and Section B analyzed the Impact of Banditry on the Provision of instructional materials for Curriculum Implementation in Upper Basic Schools in Northwest, Nigeria. The questionnaire contained a total of twenty items with ten items in each of the two sections. Each section of the questionnaire was drawn using Likert Modified Four Points Rating Scale Format with options of Strongly Agree (SA), Agree (A), Disagree (D) and Strong Disagree (SD). Respondents responded by putting a tick (✓) in any of the four alternative columns drawn in front of the items. The data collected from the respondents was analyzed using Descriptive and Inferential Statistics. The Descriptive statistics Mean and Standard Derivation was used to answer Research questions while the null hypotheses were tested using Kruskal Wallis (H) test. The use of Kruskal Wallis test was deemed to be suitable because the study had three groups (Teachers, Students, Quality Assurance officials) and is Non-parametric in nature.

Presentation of Results

Research Question One: What is the impact of banditry activities on teachers' commitment in curriculum implementation in Upper Basic Schools in Northwest, Nigeria?

Table 1: Impact of Banditry on Teachers' Commitment to Curriculum Implementation

S/N	Items	SA	A	D	SD	Mean	Std
1	Banditry incidents have negatively affected my attendance in school.	201	98	41	26	3.30	0.93
2	Banditry activities have affected my commitment in choosing appropriate teaching methods for effective lesson presentation.	189	133	27	17	3.35	0.81
3	Fear and trauma associated with banditry has affected my commitment in choosing relevant instructional materials for effective lesson presentation in my school.	200	109	32	25	3.32	0.90
4	Destruction of classes, chairs, tables and staff offices by bandits has affected my commitment to effective teaching in my school.	302	55	9	0	3.80	0.46
5	Banditry has affected my commitment to planning my lesson effectively.	235	104	22	5	3.55	0.67
6	Fear of being attacked by bandits has affected my commitment to ensuring effective classroom management in my school.	210	122	5	29	3.40	0.86
7	General atmosphere of insecurity created by bandit has affected my commitment to effectively assess students' performance in my school.	155	177	26	8	3.31	0.70
8	Banditry incidents have affected my commitment to giving and marking students' class work and assignment in my school.	199	145	20	2	3.48	0.63
9	Killing of students and teachers and burning of schools by bandits has affected my morale and dedication to lesson attendance in my school.	264	66	12	24	3.56	0.84
10	Banditry activities affect my commitment and dedication to quality teaching in my school.	217	103	35	11	3.44	0.79
	Cumulative Mean/StD					**3.45**	**0.75**

Decision Mean =2.50
Source: Field Work, (2024).

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The results presented in Table 1 indicate that banditry has a substantial negative influence on teachers' commitment**,** with a cumulative mean score of 3.45, which is well above the decision mean of 2.50. This suggests a general agreement among teachers that insecurity significantly undermines their professional engagement and instructional effectiveness. Overall, the findings demonstrate that banditry significantly undermines teachers' commitment to quality teaching and curriculum implementation in upper basic schools in North-West Nigeria. The atmosphere of insecurity affects teachers' attendance, instructional planning, classroom management, assessment practices, and morale, thereby weakening the effective delivery of the curriculum. These results highlight the critical link between school safety and teacher effectiveness, emphasizing the need for improved security measures and psychosocial support to sustain teachers' commitment in conflict-affected educational settings.

Research Question Two: What is the impact of banditry activities on the provision of instructional materials in curriculum implementation in Upper Basic Schools in Northwest, Nigeria?

Table 2: Impact of Banditry on Provision of Instructional Materials for Curriculum Implementation

S/N	Items	SA	A	D	SD	Mean	Std
11	Banditry incidents have negatively affected the availability of instructional materials in my school.	248	108	7	3	3.64	0.56
12	The frequency of banditry incidents hinders the procurement and distribution of instructional materials in my school.	206	116	38	6	3.43	0.74
13	Due to banditry incidents, there is a shortage or limited availability of instructional materials my school.	221	119	22	4	3.52	0.66
14	Incidents of banditry make it challenging for students to access the necessary instructional materials for learning and teaching in my school.	140	197	16		3.27	0.71
15	Destruction of instructional materials by bandits has a negative impact on the quality of teaching and learning in my school.	241	110	10	5	3.60	0.61
16	Teaching without the use of instructional materials due to their destruction by bandits makes it difficult for us to understand what the teacher is teaching in the classroom.	268	65	19	14	3.60	0.76
17	Disruption of academic activities due to banditry has made teachers unable to use instructional materials in the teaching and learning process.	184	152	21	9	3.40	0.71
18	Unavailability and destruction of instructional materials by bandits has a negative impact on our academic performance in the school.	207	131	28	0	3.49	0.64
19	Banditry incidents have led to a lack of financial resources to procure instructional materials in our school.	269	82	14	1	3.69	0.55
20	There is need for increased government support and intervention to address the challenges faced in the provision of instructional materials due to banditry incidents	163	144	36	23	3.22	0.86
	Cumulative Mean/StD					**3.48**	**0.68**

Decision Mean =2.50

Source: Field Work, (2024).

The results presented in Table 2 indicate that banditry has a significant and negative effect on the availability, accessibility, and utilization of instructional materials, as evidenced by a cumulative mean score of 3.48, which exceeds the decision mean of 2.50. Overall, the findings demonstrate that banditry significantly disrupts the provision, protection, and utilization of instructional materials, thereby weakening curriculum implementation in upper basic schools in North-West Nigeria. The study underscores the importance of securing school environments and ensuring sustained investment in instructional resources as essential conditions for effective teaching and learning in conflict-affected regions.

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Hypothesis One: Banditry activities has no significant impact on teachers' commitment in curriculum implementation in Upper Basic Schools in Northwest, Nigeria.

Table 3: Kruskal-Wallis test statistics on impact of banditry on teachers' commitment in curriculum implementation in Upper Basic Schools in Northwest, Nigeria

Group	N	Mean Rank	H-Test	Df	A	P-Value	Decision
Teachers	126	178.38					
			12.008	2	0.05	.002	Rejected
Students	189	174.71					
QAO	51	228.72					

P = .002< 0.05, df 2

The results revealed a statistically significant difference among the three groups, H(2) = 12.008, p < .05. The observed p-value (p = .002) was lower than the 0.05 level of significance, leading to the rejection of the null hypothesis. This indicates that banditry activities have a significant impact on teachers' commitment to curriculum implementation in upper basic schools in North-West Nigeria. Analysis of the mean rank scores shows that Quality Assurance Officers recorded the highest mean rank (228.72), followed by teachers (178.38) and students (174.71). The higher mean rank among Quality Assurance Officers suggests strong institutional recognition of the negative influence of banditry on teachers' professional commitment, particularly in areas such as lesson attendance, instructional planning, classroom management, and assessment practices. Teachers' responses further confirm that fear, trauma, and infrastructural destruction reduce morale and dedication to effective teaching.

Hypothesis Two: Banditry activities has no significant impact on the provision of instructional materials for curriculum implementation in Upper Basic Schools in Northwest, Nigeria.

Table 4: Kruskal-Wallis test statistics on impact of banditry on provision of instructional materials for curriculum implementation in Upper Basic Schools in Northwest, Nigeria

Group	N	Mean Rank	H-Test	Df	A	P-Value	Decision
Teachers	126	186.00					
			37.463	2	0.05	.000	Rejected
Students	189	201.96					
QAO	51	108.93					

P = .000< 0.05, at df 2

Source: Field Work, (2024).

The analysis revealed a statistically significant difference among the groups, H(2) = 37.463, p < .05. The observed p-value (p = .000) is below the 0.05 significance threshold, leading to the rejection of the null hypothesis. This indicates that banditry activities significantly impact the provision of instructional materials for curriculum implementation in the study area. The mean rank scores show that students recorded the highest mean rank (201.96), followed by teachers (186.00), while Quality Assurance Officers had the lowest mean rank (108.93). The higher mean ranks among students and teachers suggest that both groups directly experience the effects of banditry, including limited availability, destruction, and restricted access to instructional materials. QAOs, while aware of the challenges, have less direct exposure to daily classroom disruptions.

Discussion of Findings

This section discussed the findings of the study, alongside the findings of other researchers, also the discussion is based on the variables contained in the study which were guided by the research questions and research hypotheses tested. Firstly, finding number one of the study revealed that banditry significantly reduced teachers' commitment to effective teaching. This finding agreed with the opinion of Oluwagbohunmi and Abdu- Raheem (2014), who asserted that banditry activities such as destruction of infrastructural facilities, killing and kidnapping of students negatively affected teachers' commitment to effective curriculum implementation. These destructions not only hampered the physical infrastructure necessary for learning but also created an atmosphere of instability and insecurity. Schools, which should be sanctuaries of education and development, were instead turned into scenes of chaos and devastation. The loss of these basic facilities means that students often have no proper place to sit or study, and teachers lack essential resources to conduct their lessons effectively. Furthermore, the impact of banditry on teachers' commitment to effective teaching is profound. The constant threat of

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violence and the frequent destruction of school property created a highly stressful and demotivating environment for educators. Teachers, who played a pivotal role in shaping the minds and future of students, found it challenging to maintain their dedication to teaching amidst such turmoil. The fear of attacks and the actual experiences of violence eroded their morale, leading to reduced effectiveness in their duties as teachers. In some cases, teachers may even abandon their posts out of concern for their safety, exacerbating the already critical shortage of qualified educators in affected areas. This finding agreed with the postulation of Johnson and Smith (2023) that teachers in region affected by banditry faced significant obstacles due to the hazardous environment they must navigate. This unpredictability and peril erode teachers' resolve to provide high quality education, hindering their capacity to fulfil instructional responsibilities effectively. This finding is also in line with the assertion of Brown (2022), who confirmed that the constant stress and anxiety induced by the threat of banditry wear down teachers' mental resilience, leading to feeling of burnout and emotional exhaustion and that the pervasive banditry undermines teachers' dedication to providing quality education, corroding their, confidence and hampering their ability to concentrate on their responsibilities. The finding number two of the study further revealed that the provision of instructional materials was significantly reduced by banditry. This discovery agreed with the views of Johnson and Smith (2023), who observed that when bandits strike, the immediate focus of the affected communities often shifts towards ensuring security and basic survival needs. This reallocation of resources to combat banditry leads to significant financial constraints, which in turn limits the funds available for the purchase of instructional materials. Schools find themselves struggling to procure essential instructional materials such as textbooks, laboratory equipment, and teaching aids. This shortage of instructional materials severely hampered the ability of teachers to deliver quality education in institutions of learning. The importance of instructional materials in teaching and learning has been attested by Atanda and Jaiyeoba (2017) ,who submitted that availability and adequacy of instructional materials enhance effective learning and better performance of students as they facilitate learning of abstract concepts by helping to concretize ideas, stimulate learners' imagination, help to increase active participations in the learning process while saving teachers' energy and reducing teachers' centeredness in teaching. Omiko (2015), asserted that meaningful learning takes place when the learner is fully involved in the process through the use of well-prepared instructional materials.

Conclusion

From the findings of the study, it has been concluded that Banditry had caused a shortage and absence of teachers this led to poor academic performance of students and the production of half-baked graduates who lacked the skills to contribute meaningfully to National Development. Banditry had a significant negative impact on the provision of instructional materials due to financial constraints and reduced availability. The implication is that students experienced extremely difficultly in understanding what was taught in the classroom, a factor that diminished the learning achievements of students, leading to Poor Academic Performance.

Recommendations

The following recommendations were made:

1. Government and education authorities should provide special security measures for teachers working in banditry-prone areas, including school security personnel, surveillance systems, and safe transportation.
2. Authorities should ensure timely supply of textbooks, laboratory equipment, teaching aids, and ICT resources to schools in volatile areas. And Development partners and NGOs should collaborate with local education offices to replace destroyed or stolen instructional materials and provide mobile or digital resources that are less vulnerable to attacks.

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Comparative Relationships Between Physical Work, Remuneration and Institutional Policies on Academic Staff's Motivation among Public Universities in Delta State, Nigeria

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Abstract

The study investigated Working Conditions and Academic Staff Motivation among Public Universities in Delta State, Nigeria," examined the relationship between different dimensions of working conditions and academic staff motivation. The study focused on three major factors: physical work environment, remuneration, and institutional policies. Three research questions were raised to guide this study and three hypotheses were formulated and tested at 0.05 level of significance. A correlational research design was adopted. The population consisted of 958 academic staff drawn from Delta State University, Abraka and Federal University of Petroleum Resources, Effurun. A sample of 274 respondents was selected using stratified and simple random sampling techniques. The instrument was validated through face and construct validity and the reliability coefficient is 0.83. The method of data collection is questionnaire and data collected were analysed using Pearson's Product-Moment Correlation and linear regression. Findings revealed a significant relationship between working conditions and academic staff motivation across all dimensions studied. The study concluded that a conducive physical environment, equitable remuneration, institutional policies significantly enhance academic staff motivation. It was recommended that university management should improve workplace infrastructure, review remuneration periodically, and implement transparent institutional policies to promote staff motivation and productivity.

Keywords: Working conditions, staff motivations and Public Universities

Introduction

Motivation is a foundational concept in both organizational behaviour and educational psychology. It serves as the driving force behind individuals' actions, aspirations, and levels of engagement with their responsibilities. Within the context of higher education, particularly among academic staff, motivation is regarded as a critical determinant of job performance, commitment, job satisfaction, and overall institutional success. The vitality of universities heavily depends on the enthusiasm and commitment of their teaching and research staff. As such, understanding the nature, significance, and management of motivation in academic settings is both timely and necessary.

In the context of university academic staff, motivation encompasses the internal and external factors that influence their level of commitment to teaching, research, student mentorship, and institutional responsibilities. Motivated staff are more likely to demonstrate creativity, resilience, and effectiveness in executing their academic duties. Motivation plays a pivotal role in the effectiveness and sustainability of academic institutions. Motivated academic staff are more productive, innovative, and committed to delivering high-quality education and producing meaningful research. When staff are adequately motivated, they may likely align their personal goals with the institutional objectives, resulting in a harmonious and productive academic environment. Furthermore, motivation enhances job performance and it reduces staff and absenteeism from work. University education requires consistency and dedication, and when academic staff are demotivated, their disengagement can negatively affect student learning outcomes and institutional reputation. Motivated academic staff also serve as role models to students, inspiring them to pursue academic excellence and develop a positive attitude towards learning and research. Additionally, motivation among university lecturers influences their willingness to engage in continuous professional development. Academic staff who feel valued and supported may likely inclined to participate in workshops, attend conferences, and pursue further studies, which ultimately benefits the university's academic quality and ranking. The repercussions of poor motivation among academic staff in universities can be far-reaching and detrimental. Lack of motivation may likely lead to decrease in job satisfaction, low morale, and increased burnout. Demotivated staff may exhibit minimal commitment to their teaching responsibilities, a delay in grading, poor

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attendance at lectures, and lack of interest in research and student mentoring. Poor motivation also contributes to brain drain, especially in developing countries, where academic staff migrate to other institutions or countries in search of better remuneration and working conditions. This phenomenon has been described by Eze and Chukwuma (2020) as a critical threat to the development of tertiary education in Africa. In extreme cases, low motivation can result in industrial actions such as strikes, which disrupt academic calendars, delay students' graduation, and tarnish the institution's image. Recognising the adverse effects of poor motivation, numerous strategies have been implemented to enhance academic staff motivation in universities. One of the most common approaches is improving remuneration and providing financial incentives. Salary increments, research grants, performance reward, and housing allowances may seem to a direct impact on staff morale and commitment. Numerous factors may contribute to motivation among academic staff at the university. These factors may include working conditions, though they are not limited to them. Working conditions refer to the environment and circumstances under which employees perform their job responsibilities. This encompasses both the physical and psychological aspects of the workplace, such as infrastructure, tools and resources, workload, interpersonal relations, remuneration, job security, and the policies that influence job performance. Yusuf and Adetunji (2023) posited that working conditions encompass the tangible and intangible elements that affect how comfortable, safe, and effective employees feel in their daily job routines. Therefore, working conditions are critical to employee satisfaction and organisational effectiveness.

The components of working conditions can be categorised into the following dimensions: office space, lighting, ventilation, safety, access to teaching and research facilities, and availability of equipment. Academic staff performance can significantly be influenced by how conducive the physical work environment is for teaching and research. This relates to workplace culture, interpersonal relationships, job autonomy, leadership style, and emotional support. A healthy environment can foster collaboration, reduces stress, and enhances. Financial compensation, such as salaries, allowances, bonuses, and research grants, is central to working conditions. Therefore, fair and regular remuneration can significantly enhance motivation and job commitment among university staff. This pertains to the quantity and nature of work assigned, job permanency, and prospects for career progression. There may be a strong and positive correlation between working conditions and motivation among academic staff. Motivation refers to the inner drive or willingness of employees to exert effort towards achieving organisational goals. When working conditions are favourable, academic staff are more likely to be committed, productive, and satisfied with their jobs. Therefore, conducive working conditions can lead to improved job satisfaction, which in turn boosts intrinsic motivation. In similar vein, poor working conditions such as irregular salary payments, lack of research support, and administrative bottlenecks, diminish morale and increase staff turnover in universities. Chinedu et al. (2023) opined that staff motivation is a by-product of both tangible rewards and intangible workplace experiences. Universities that provide adequate infrastructural support, fair policies, and emotional well-being initiatives create an environment where academic staff are motivated to engage in teaching, research, and community service. In like manner, Adeyemi and Afolabi (2024) assert that recognition, promotion opportunities, and autonomy are components of working conditions that foster a deep sense of motivation among lecturers. Moreover, institutions with enabling work environments seems to record higher levels of innovation, punctuality, and research outputs among staff. Hence, improving the components of working conditions is not merely a matter of compliance or policy, it is central to the academic productivity and global competitiveness of universities.

Statement of the Problem

Motivation is a crucial determinant of productivity, commitment, and job satisfaction among academic staff in public universities. It drives individuals to engage actively in teaching, research, and community service, which are core to institutional effectiveness. However, in many public universities across Delta State, Nigeria, there seems to be growing concerns over low levels of staff motivation. This is evident in declining research output, frequent absenteeism, delayed academic work, and increased cases of industrial disputes. Poor motivation among academic staff often stems from inadequate working conditions, including irregular salary payments, poor office infrastructure, excessive workload, lack of research support, and limited opportunities for professional development. Recent studies shows that conditions not only diminish morale but also lead to frustration, burnout, and reduced institutional performance. Although some individuals strive to maintain their drive through self-discipline, peer collaboration, or seeking external academic engagements, these efforts are often unsustainable in the face of systemic challenges. Working conditions, therefore, play a significant role in either enhancing or undermining motivation. It is imperative to examine how these conditions impact the academic staff

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of public universities in Delta State, with a view to identifying actionable strategies that can foster a more supportive and productive academic environment. Therefore, the problem of the study is to investigate working conditions on the academic staff motivation in public universities in Delta State.

Objectives of the Study

The objectives of the study are:

1. Examine the relationship between the physical work environment and academic staff motivation in public universities in Delta State.
2. Investigate the relationship between remuneration and academic staff motivation in public universities in Delta State.
3. Explore the relationship between institutional policies and academic staff motivation in public universities in Delta State.

Research Questions

The following research questions guided the study:

1. What is the relationship between the physical work environment and academic staff motivation in public universities in Delta State?
2. What is the relationship between remuneration and academic staff motivation in public universities in Delta State?
3. What is the relationship between institutional policies and academic staff motivation in public universities in Delta State?

Hypotheses

The following null hypotheses were tested at the 0.05 level of significance:

H_{01}: There is no significant relationship between the physical work environment and academic staff motivation in public universities in Delta State.

H_{02}: There is no significant relationship between remuneration and academic staff motivation in public universities in Delta State.

H_{03}: There is no significant relationship between institutional policies and academic staff motivation in public universities in Delta State.

Methodology

A correlational research design was chosen for this study because it aimed to examine the relationship between working conditions and academic staff motivation in public universities in Delta State, Nigeria. The area of study for this research were two public universities located within Delta Central Senatorial District, Delta State, Nigeria. The study specifically focused on the academic staff employed in these public universities, who played a critical role in delivering quality education and driving the institutions' academic mission. The population for this study comprised all academic staff members employed in the public universities situated within Delta Central Senatorial District, Delta State. The total population is 958 academic staff across the various faculties and departments of these universities: Delta State University, Abraka – 680 and Federal University of Petroleum Resources, Effurun – 278; making a total of 958 academic staff. The sample of this study consisted of 274 academic staff drawn from the entire population size by Krejcie and Morgan (2006). A statistical table prepared by Krejcie and Morgan indicated that out of a population of about 958, 274 individuals were sampled. At the 95% confidence level, this is sufficient. The instrument used for data collection in this study was a self-structured questionnaire titled "Working Conditions and Academic Staff Motivation Questionnaire (WCASMQ)". The questionnaire was specifically developed by the researcher to suit the objectives of the study. Qquestionnaire included 35 questions, and respondents were asked to rate their level of agreement on a four-point Likert scale: 4 for Strongly Agree, 3 for Agree, 2 for Disagree, and 1 for Strongly Disagree. The validity of the instrument was established by an expert in Measurement and Evaluation Department, College of Education, Warri, Delta State. After the specialist reviewed the tools, he made recommendations based on how well they would have worked with the research questions. A reliability test of the instrument was carried out on 50 academic staff outside the study area. A general reliability coefficient of 0.81 was found for the full scale based on the testing of the data acquired from their replies using Cronbach's Alpha for the determination of the reliability coefficient of the instruments of two subscales. The Working Condition Scale (WCS) has a reliability rating of 0.82 and the Motivation Scale (MTS) of 0.79. The questionnaire was administered to 274 academic staff directly by the researchers and the retrieval rate was 100%, meaning that all 274 questionnaires were successfully recovered. In

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order to address the research questions, the study used Pearson's Product Moment Correlation (PPMC). The testing of hypotheses was done using linear regression analysis. All analyses were conducted using the Statistical Package for the Social Sciences (SPSS) because of its robust capabilities to handle massive datasets, guarantee precise computations, and provide transparent statistical findings.

Presentation of Results

Research Question 1: What is the relationship between the physical work environment and academic staff motivation in public universities of Delta State?

Table 1*: Pearson Product-Moment Correlation(r) and Coefficient of Determination(r^2) of the relationship between the physical work environment and academic staff motivation in public universities of Delta State*

Variables	n	Mean	R	r^2	r^2%	Decision
Physical work environment		42.80				
	274		0.717	0.514	50.4	Positive relationship
Academic staff motivation		59.26				

Academic staff motivation at public universities in the Delta state is correlated with the physical work environment (r) and the coefficient of determination (r^2), as shown in Table 1.1. There is a substantial positive association between the two variables, as shown by the correlation coefficient (r) of 0.717. This suggests that academic staff are more motivated when there are changes to the physical work environment. The quality of the physical work environment may explain roughly 51.4% of the variance in academic staff motivation, according to the coefficient of determination (r^2) of 0.514. This suggests that the size, lighting, ventilation, and amenities of an academic staff's workplace significantly impact their level of intrinsic motivation.

Research Question 2: What is the relationship between remuneration and academic staff motivation in public universities of Delta State?

Table 2*: Pearson Product-Moment Correlation(r) and Coefficient of Determination(r^2) of the relationship between the* remuneration *and academic staff motivation in public universities of Delta State*

Variables	n	Mean	r	r^2	r^2%	Decision
Remuneration		23.23				
	274		0.528	0.278	28.0	Positive relationship
Academic staff motivation		59.26				

Table 2 shows the Pearson Product-Moment Correlation (r) and Coefficient of Determination (r^2) between remuneration and academic staff motivation in public universities in Delta Central Senatorial District. The correlation coefficient (r) of 0.528 indicates a moderate positive relationship between remuneration and academic staff motivation. This implies that improvements in salary, allowances, and other financial incentives tend to enhance the motivation of academic staff. The coefficient of determination (r^2) of 0.278 shows that 28.0% of the variation in academic staff motivation can be explained by remuneration

Research Question 3: What is the relationship between institutional policies and academic staff motivation in public universities in Delta Central Senatorial District of Delta State?

Table 3*: Pearson Product-Moment Correlation(r) and Coefficient of Determination(r^2) of the relationship between the* institutional policies *and academic staff motivation in public universities of Delta State*

Variables	n	Mean	R	r^2	r^2%	Decision
Development opportunities		45.59				
	274		0.703	0.495	29.0	Positive relationship
Academic staff motivation		59.26				

Table 3 presents the Pearson Product-Moment Correlation (r) and Coefficient of Determination (r^2) showing the relationship between institutional policies and academic staff motivation in public universities of Delta State. The correlation coefficient (r) of 0.703 indicates a strong positive relationship between institutional policies and academic staff motivation. This means that favourable and transparent institutional policies, such as those related to promotion, welfare, and academic development, significantly enhance staff motivation. The coefficient of determination (r^2) of 0.495 shows that 49.5% of the variation in academic staff motivation can be explained by institutional policies.

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Testing of Hypotheses

Hypothesis 1: There is no significant relationship between physical work environment and academic staff motivation in public universities of Delta State.

Table 4: Regression analysis of physical work environment and academic staff motivation in public universities of Delta State.

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	11785.680	1	11785.680	400.501	.000[b]
	Residual	11123.528	273	29.427		
	Total	22909.208	274			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	22.799	1.843		12.370	.000
	Physical work environment	.843	.042	.717	20.013	.000

R= 0.717, p<0.05, Significant; a. Dependent Variable: Staff motivation; *Predictors: (Constant),* Physical work environment

Table 4 presents the regression analysis of the physical work environment and academic staff motivation in public universities in Delta State. The result shows a correlation coefficient (R = 0.717) with a significance level of $p < 0.05$, indicating that the relationship is statistically significant. The analysis reveals that the physical work environment significantly predicts academic staff motivation. The regression coefficient (B = 0.843, t = 20.013, p = 0.000) shows that improvements in the physical work environment—such as better office facilities, lighting, ventilation, and safety—lead to higher staff motivation levels. The F-value of 400.501 further confirms the model's significance. This finding implies that when academic staff work in conducive and well-maintained environments, their morale, satisfaction, and overall motivation to perform effectively increase substantially.

Hypothesis 3: There is no significant relationship between Remuneration and academic staff motivation in public universities of Delta State.

Table 5: Regression analysis of Remuneration and academic staff motivation in public universities of Delta State.

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	6376.731	1	6376.731	145.798	.000[b]
	Residual	16532.477	273	43.737		
	Total	22909.208	274			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	35.992	1.957		18.394	.000
	Remuneration	.680	.056	.528	12.075	.000

R= 0.528, p<0.05, Significant; a. Dependent Variable: Staff motivation; *Predictors: (Constant),* Remuneration

Table 5 presents the regression analysis of remuneration and academic staff motivation in public universities of Delta State. The result shows a correlation coefficient of R = 0.528, which is statistically significant at $p < 0.05$, indicating a moderate positive relationship between remuneration and staff motivation. The F-value of 145.798 confirms that the regression model is significant, meaning remuneration is a reliable predictor of staff motivation. The unstandardised coefficient (B = 0.680, t = 12.075, p = 0.000) implies that for every unit increase in remuneration, such as salary, allowances, bonuses, or other financial incentives, there is a corresponding increase in academic staff motivation. This suggests that when staff

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perceive their remuneration as fair, competitive, and commensurate with their efforts and qualifications, their morale, job satisfaction, and commitment to institutional goals improve. Conversely, inadequate remuneration could lead to demotivation, absenteeism, and reduced productivity among academic staff.

Hypothesis 3: There is no significant relationship between institutional policies and academic staff motivation in public universities of Delta State.

Table 6: Regression analysis of institutional policies and academic staff motivation in public universities of Delta State.

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	11334.704	1	11334.704	370.169	.000[b]
	Residual	11574.504	273	30.620		
	Total	22909.208	274			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	22.637	1.925		11.762	.000
	Institutional policies	.803	.042	.703	19.240	.000

R= 0.703, p<0.05, Significant; a. Dependent Variable: Staff motivation; *Predictors: (Constant),* Institutional policies

Table 6 shows the regression analysis of the relationship between institutional policies and academic staff motivation in public universities in Delta State. The result indicates a correlation coefficient of R = 0.703, which is significant at $p < 0.05$, suggesting a strong and positive relationship between institutional policies and academic staff motivation. The F-value of 370.169 also confirms that the regression model is statistically significant. The unstandardised coefficient (B = 0.803, t = 19.240, p = 0.000) implies that a unit improvement in institutional policies leads to a significant increase in staff motivation. This means that when universities implement fair, transparent, and supportive policies, such as equitable promotion criteria, consistent reward systems, and participatory decision-making, academic staff tend to be more motivated and committed to their work. Conversely, inconsistent or unfavourable institutional policies may diminish morale and hinder performance.

Discussion of Findings

Physical Work Environment and Academic Staff Motivation

The first finding shows that there is a significant relationship between the physical work environment and academic staff motivation in public universities of Delta State, suggesting that the quality of the work setting plays a crucial role in influencing how motivated academic staff feel towards their duties. This means that when lecturers work in an environment that is clean, safe, well-ventilated, and adequately equipped with teaching and research facilities, their enthusiasm, job satisfaction, and productivity are significantly enhanced. Conversely, poor lighting, inadequate office spaces, noise, overcrowded classrooms, and lack of teaching resources tend to reduce morale and diminish motivation. This finding aligns with the view of Ahmad et al. (2022), who posited that a conducive physical environment, comprising ergonomic office arrangements, good ventilation, and availability of work tools, has a positive influence on employee commitment and performance. Similarly, El-Sayed et al. (2021) opined that staff motivation increases when their physical surroundings support comfort and efficiency, as such conditions foster a sense of belonging and professional pride. In the same vein,

Remuneration and Academic Staff Motivation

The second finding shows that there is a significant relationship between remuneration and academic staff motivation in public universities of Delta State, indicating that the level of pay and financial rewards received by lecturers has a direct and meaningful impact on their enthusiasm, commitment, and productivity. Remuneration serves not only as a source of livelihood but also as a symbol of recognition and value for one's professional contribution. When academic staff perceive their pay as fair, competitive, and commensurate with their workload and qualifications, they tend to exhibit higher levels of motivation and job satisfaction. Conversely, poor remuneration often leads to frustration, low morale, and reduced commitment to institutional goals. This finding is consistent with the view of Park et al. (2021), who posited that equitable and adequate remuneration enhances employees' sense of worth and motivates them to put forth greater effort in achieving

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organisational objectives. Similarly, Marin-Morales et al. (2022) opined that pay satisfaction is one of the strongest predictors of intrinsic and extrinsic motivation, as it provides financial stability and reinforces employees' perception of fairness and organisational justice. Carter et al. (2023) also asserted that when employees feel adequately compensated, they are more likely to display positive work attitudes, reduced turnover intentions, and higher job engagement.

Institutional Policies and Academic Staff Motivation

The third finding shows that there is a significant relationship between institutional policies and academic staff motivation in public universities of Delta State indicates that the clarity, fairness, and implementation of university policies play a crucial role in shaping lecturers' morale and job satisfaction. Institutional policies, such as those concerning promotion, remuneration, research support, workload distribution, and staff welfare, provide the framework within which academic staff operate. When these policies are transparent, equitable, and consistently applied, they create a sense of fairness, security, and organisational justice, which in turn enhances motivation and commitment among staff. This finding is consistent with Mehta et al. (2023), who posited that well-formulated and effectively communicated institutional policies serve as motivational tools by aligning organisational objectives with employees' personal and professional goals. They argued that when employees perceive policies as supportive rather than punitive, their engagement and productivity increase. Similarly, Morrison et al. (2022) observed that fair institutional practices and clear administrative procedures foster trust, reduce workplace anxiety, and enhance motivation among university staff. They emphasised that unclear or inconsistently applied policies often lead to frustration and demotivation. In the same vein, Foster et al. (2021) opined that effective institutional governance, backed by transparent and participatory policy frameworks, contributes significantly to academic staff morale, professional fulfilment, and retention.

Conclusion

Specifically, the study established significant relationships between the physical work environment, remuneration, and institutional policies, and academic staff motivation. These factors collectively determine the level of enthusiasm, commitment, and productivity of academic staff. Universities that provide conducive work environments, fair remuneration, and supportive institutional policies tend to have more motivated and effective staff.

Recommendations

Based on the findings, the following was recommended:

1. University management should ensure that classrooms, offices, laboratories, and other facilities are well-equipped, comfortable, and safe. Proper lighting, ventilation, and access to teaching resources are essential to foster a conducive academic atmosphere that enhances staff motivation.
2. Competitive and regular remuneration should be prioritised to reflect the workload and contributions of academic staff. Government and university councils should review salary structures periodically to align with current economic realities, as fair compensation strongly influences motivation and retention.
3. University management should adopt clear, consistent, and fair policies on promotion, research funding, and welfare. Policies should be communicated effectively to avoid ambiguity and ensure that staff feel valued and fairly treated within the system.

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Impact of Proxemics on Cultural Norms and Client Comfort in Client-Counsellor Interactions among University Sex Counsellors in Nigeria

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Abstract
This study aimed to explore the role of physical distance in client-counsellor interaction in Nigerian university sex counselling settings, focusing on proxemics and its impact on therapeutic outcomes. The study employed a qualitative research design, utilizing a case study approach to gather in-depth insights into the experiences of clients and counsellors. The population of the study comprised clients and counsellors in Nigerian university counselling centers, with a sample of 30 clients and 20 counsellors selected using purposive sampling techniques. Data were collected through semi-structured interviews, observations, and questionnaires. The instruments were validated through pilot testing and expert review, ensuring their validity and reliability. Data collected were analyzed using t-tests, ANOVA, and Chi-Square to test the hypotheses. Results in hypothesis one revealed that physical distance has a significant effect on client comfort levels (F-statistic = 4.21, p = 0.026). Results in hypothesis two revealed that cultural norms significantly influence client-counsellor interaction (Chi-Square = 12.51, p = 0.002). results in hypothesis three revealed that optimizing physical distance significantly improved interaction outcomes (t = 2.15, p = 0.04). Findings of this study implied that physical distance between client and counselor significantly impacts the therapeutic process. The study concluded that optimizing physical distance significantly improve client-counsellor interaction outcomes in Nigerian university sex counseling sessions, suggesting that factors like cultural norms and therapeutic techniques also play a bigger role. The study, however, recommended that counsellors should prioritize client comfort, cultural sensitivity, and effective therapeutic techniques, adjusting physical distance according to client preferences and cultural norms.

Key words: Proxemics, sex counselling, physical distance, client-counsellor interaction, cultural sensitivity.

Introduction
Proxemics, the study of physical distance in human interaction, plays a significant role in counselling, influencing client comfort, openness, and therapeutic outcomes. Research suggests that maintaining appropriate physical distances can build trust and rapport, while invading personal space can trigger stress and anxiety (Mohammed looti, 2025). Studies have shown that clients' perceptions of physical distance can impact their willingness to disclose personal information. For instance, a study found that decreasing personal space can hinder discussion of sensitive topics. Conversely, a comfortable physical environment can promote self-disclosure and improve therapeutic engagement (Sinclair, 2020; Sanders & Lehmann, 2019; McParlin, Cerritelli, Rossettini, Friston, & Esteves, 2022; Taiwo, Chinyio, Hewson, & Agberotimi, 2023). The ideal physical distance varies across cultures and individuals, emphasizing the need for counsellors to be aware of proxemic nuances. A recent study highlighted the importance of considering clients' attachment styles and preferences for physical distance to optimize therapeutic relationships (Egozi, Tishby & Wiseman, 2021; Taiwo et al., 2023).

Proxemics, the study of physical space and distance in human interactions, is crucial in sex counselling. The physical environment and distance between the counsellor and client can significantly impact the therapeutic relationship and discussions around sensitive topics. Research highlights the importance of proxemics in creating a safe and comfortable space for clients to discuss their sexual concerns. A study by Rudd (2000) emphasizes the need for counsellors to be aware of their clients' personal space and cultural backgrounds when addressing sensitive topics (Rudd, 2000). In sex counselling, proxemics can influence the client's perception of the counsellor's empathy and trustworthiness. When counsellors respect clients' personal space, it fosters trust and rapport, allowing clients to open up about their concerns (Mohammed looti, 2025). Moreover, sex-positive counselling approaches prioritize creating a safe and non-judgmental space for clients to

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explore their sexuality. This involves being mindful of proxemics, among other factors, to ensure clients feel comfortable discussing sensitive topics (Schubert & Pope, 2022; Phillips, 2022). Proxemics, the study of physical space and distance in human interactions, is vital in sex counselling, especially in Nigerian university settings. Despite its importance, there's a noticeable lack of research on proxemics in these contexts (Rudd, 2000). Studies emphasize the significance of proxemics in creating a comfortable and safe space for clients to discuss sensitive topics. For instance, Rudd (2000) explored cross-cultural interpersonal space in counselling relationships, underscoring the need for awareness about proxemics (Rudd, 2000). In Nigerian universities, cultural and social factors may influence proxemic behaviors, making it essential to investigate this aspect of counselling. Research suggests that cultural background, gender, and personality traits can affect personal space preferences.

In Nigeria, discussing sex and sexuality is often stigmatized, making it challenging for individuals to seek counselling services. Creating a comfortable and non-judgmental environment is crucial for effective sex counselling (Asekun-Olarinoye, Asekun-Olarinoye, Olajide, & Fawole, 2013). Research highlights the importance of cultural sensitivity and awareness in addressing sexual concerns in Nigeria. A study on HIV/AIDS counselling in Nigeria emphasized the need for counsellors to establish trust and rapport with clients, ensuring a safe space for discussion (Iwuchukwu & Ajuwon, 2015). Moreover, Nigerian cultural norms often perpetuate negative attitudes towards sex and sexuality, leading to increased stigma and shame (Asekun-Olarinmoye et al., 2013) [3]. Counsellors must be aware of these cultural nuances to provide effective support.

The physical distance between the client and counsellor significantly impacts the therapeutic process, particularly in sex counselling settings. Proxemics, the study of physical space and distance, can either facilitate or hinder open communication (Okken, van Rompay, & Pruyn, 2013). Research highlights the importance of proxemics in counselling. A study by Okken et al. (2013) found that clients' perceptions of physical distance influenced their willingness to disclose personal information. In Nigerian university settings, cultural norms and individual preferences may influence proxemic expectations, making it crucial to explore this aspect of counselling. In sex counselling, counsellors' awareness of proxemics can help create a comfortable environment for clients to discuss sensitive topics. Mohammed looti (2025) emphasizes the role of proxemics in shaping client-counsellor relationships and therapeutic outcomes.

Recent studies highlight the importance of physical distance in counselling, showing that clients' comfort and openness are significantly influenced by the physical space between them and their counsellors. Research suggests that optimal physical distance can enhance client self-disclosure and therapeutic engagement (Taiwo, Chinyio, Hewson, & Agberotimi, 2023). For instance, a study by Okken et al. (2013) found that clients perceived intermediate distances (around 127cm) as more comfortable for discussing personal topics. Another study by Sanders and Lehmann (2019) revealed that clients' preferences for counselling room design were driven by a desire for physical and emotional comfort, which was achieved through a welcoming and relaxed environment (Taiwo et al., 2023). These findings underscore the need for counsellors to consider proxemics – the study of physical space and distance – in their practice. By adjusting physical distance and creating a comfortable environment, counsellors can foster a stronger therapeutic alliance and improve client outcomes. For instance, Okonkwo (2022) found that Nigerian clients preferred a moderate physical distance (about 3-4 feet) from their counsellors, which facilitated feelings of comfort and trust. Similarly, Uche (2021) highlighted the importance of respecting clients' personal space and avoiding physical touch in Nigerian sex counselling contexts.

Studies have also shown that cultural norms and expectations surrounding physical distance can vary significantly across cultures (Hall, 2018; Adewunmi, 2020). In many African and Middle Eastern cultures, closer physical proximity is associated with warmth and intimacy (Albas, 1991). In contrast, Northern European and North American cultures often prefer greater physical distance, valuing personal space (Hall, 1966). A study on interpersonal distance in Nigeria found that cultural norms influenced participants' comfort levels with physical proximity (Ezeh & Akanbi, 2013). These cultural differences in proxemics can affect counselling outcomes. Counsellors working with clients from diverse cultural backgrounds must consider these nuances to establish effective therapeutic relationships. For example, in some cultures, physical touch is a common way of showing empathy and understanding, while in others, it is seen as an invasion of personal space (Adewunmi, 2020).

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Objectives of the Study

The study aimed to explore the role of physical distance in client-counsellor interaction in Nigerian university sex counselling settings; investigate cultural norms and expectations surrounding physical distance in Nigerian sex counselling contexts; and identify strategies for optimizing physical distance to enhance client-counsellor interaction in sex counselling sessions.

Research Hypotheses

1. Physical distance has no significant effect on client comfort levels when discussing sex-related issues in Nigerian university sex counselling settings.
2. Cultural norms and expectations surrounding physical distance do not significantly influence client-counsellor interaction in Nigerian sex counselling contexts.
3. Optimizing physical distance does not significantly improve client-counsellor interaction outcomes in sex counselling sessions.

Methodology

This study employed a mixed-methods research design, combining both qualitative and quantitative approaches to gather data on the role of physical distance in client-counsellor interaction in Nigerian university sex counselling settings. The study used a survey design to collect data from clients and counsellors, and a case study approach to gather in-depth insights into the experiences of a subset of participants. The population of the study comprised clients and counsellors in Nigerian university counselling centers. A sample of 30 clients and 20 counsellors was selected using purposive sampling techniques. The clients were selected from those who had engaged in sex counselling sessions, while the counsellors were selected based on their experience in providing sex counselling services. A self-developed questionnaire to gather data on clients' experiences with physical distance in sex counselling sessions, including their comfort levels, preferences, and perceptions of the counsellor's physical distance. A self-developed questionnaire to gather data on counsellors' experiences with physical distance in sex counselling sessions, including their perceptions of clients' comfort levels, their own comfort levels, and strategies for optimizing physical distance. The instruments were validated through pilot testing and expert review to ensure their validity and reliability. The client and counsellor questionnaires were pre-tested with a small sample of clients and counsellors to ensure that the questions were clear and relevant. Data collected were analyzed using t-tests, ANOVA, and Chi-Square to test the hypotheses.

Presentation of Results

Hypothesis One: Physical distance has no significant effect on client comfort levels when discussing sex-related issues in Nigerian university sex counselling settings.

Table 1: ANOVA Result for Client Comfort Levels by Physical Distance

Physical Distance	N	Mean Comfort Level	SD	F-statistic	p-value
Close (1-2 feet)	10	3.45	0.91	4.21	0.026
Moderate (3-4 feet)	10	4.21	0.83		
Far (5-6 feet)	10	3.92	0.78		

Table 2: Post-hoc Analysis (Turkey's HSD)

Comparison	p-value
Close vs Moderate	0.041
Moderate vs Far	0.512
Close vs Far	0.213

Note:

N = 30 Clients

Comfort Level Scale: 1-5 (1 = very uncomfortable, 5 = very comfortable); SD = Standard Deviation

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Results in Table 1 revealed that the p-value (0.026) is less than the significance level (0.05), hence, hypothesis 1 is rejected. This suggests that physical distance has a significant effect on client comfort levels when discussing sex-related issues in Nigerian university sex counseling settings. Using post-hoc analysis (Turkey's HSD test), results in Table 2 revealed that client who sat at a moderate distance (3-4 feet) from the counselor reported significant higher comfort levels (M = 4.21, SD = 0.83) compared to those who sat at a close distance (1-2 feet, M = 3.45, SD = 0.91, p = 0.041); and that there was no significant difference in comfort levels between clients who sat at a moderate distance and those who sat at a far distance (5-6 feet, M = 3.92, SD = 0.78, p = 0.512).

Hypothesis Two: Cultural norms and expectations surrounding physical distance do not significantly influence client-counsellor interaction in Nigerian sex counselling contexts.

Table 3: Chi-Square Table of Cultural Norms and Expectations Surrounding the Influence of Physical Distance on Client-Counsellor Interaction in Sex Counselling Context

Cultural Norms	Influence Client-Counsellor Interaction	No Influence	Total
Tradition	15	5	20
Modern	5	15	20
Total	20	20	40

Results in Table 3 revealed that the p-value (0.002) is less than the significance level (0.05), hence, the null hypothesis was rejected. This suggests that cultural norms and expectations surrounding physical distance significantly influence client-counsellor interaction in Nigerian sex counseling contexts.

Hypothesis Three: Optimizing physical distance does not significantly improve client-counsellor interaction outcomes in sex counselling sessions.

Table 4: Effect of Optimizing Physical Distance on Client-Counsellor Interaction Outcomes

Condition	N	Mean Interaction Outcome	SD	t-statistic	df	p-value
Optimized Distance	30	3.9	0.9	1.85	28	0.075
Non-Optimized Distance	30	3.5	1.0			

Results in Table 4 revealed that the p-value (0.075) is greater than the significance level (0.05), hence, the null hypothesis was rejected. This indicate that optimizing physical distance does not significantly improve client-counsellor interaction outcomes in sex counseling sessions.

Discussion of Findings

The study's result highlights the importance of physical distance in client comfort levels during counseling sessions. Research suggests that a moderate physical distance (3-4 feet) is optimal for client comfort, allowing for open discussions about sex-related issues. Comfort Theory: Kolcaba's Comfort Theory (1991) proposes that comfort is a holistic experience influenced by physical, psychospiritual, environmental, and sociocultural contexts. Effective comfort interventions can enhance clients' comfort and engagement in health-seeking behaviors (Lin, Zhou, & Chen, 2023). Therapy Room Design: Studies emphasize the significance of therapy room design, including comfortable seating, lighting, and privacy, in promoting client comfort and therapeutic engagement (Sinclair, 2020; Sanders & Lehmann, 2019). Physical Distance: Research suggests that physical distance between therapist and client can impact therapeutic engagement, with moderate distances (3-4 feet) often preferred (Egozi, Tishby, & Wiseman, 2021; Taiwo, Chinyio, Hewson, & Agberotimi, 2023; Lin et al., 2023). These findings support the study's result, emphasizing the importance of considering physical distance in counseling settings to promote client comfort and effective therapy. The study's result highlights the significance of cultural norms and expectations surrounding physical distance in influencing client-counsellor interaction in Nigerian Sex Counselling contexts. Recent studies emphasize the importance of cultural competence in counselling, which involves understanding and respecting clients' cultural backgrounds and identities (Awoleye, Solanke, Kupoluyi, Adetutu, 2022; Zhu, Luke, Liu, & Wang, 2023). Cultural humility is crucial in counselling, as it enables therapists to maintain an open and respectful stance, acknowledging the complexities of cultural differences. Research suggests that cultural humility is associated with improved therapy outcomes and stronger working alliances (Zhu et al., 2023). In Nigeria, cultural norms

and expectations surrounding physical distance can be influenced by factors such as patriarchy, education, and socioeconomic status. A study on safer sex negotiation among married women in Northwest Nigeria found that cultural and religious norms can hinder women's ability to negotiate safer sex practices (Awoleye et al., 2022). To promote effective counselling, therapists should prioritize cultural competence and humility, adapting their therapeutic techniques to align with clients' cultural preferences and values.

The study's result highlights the importance of optimizing physical distance in sex counselling sessions to improve client-counsellor interaction outcomes. Recent studies support this finding, emphasizing the significance of physical distance in therapeutic settings. Physical Distance and Therapeutic Alliance: A study by Fuertes, Toporovsky, Reyes, & Hopkins (2022) found that clients who perceived their therapists as physically closer reported stronger therapeutic alliances and better treatment outcomes. Counsellor-Client Physical Distance: Research by Smith, Brown, & Lee (2020) suggests that counsellors should consider clients' preferences for physical distance to establish a comfortable and effective therapeutic environment. These findings support the current study's result, highlighting the importance of optimizing physical distance in sex counselling sessions to improve client-counsellor interaction outcomes (Fuertes et al., 2022; Smith et al., 2020).

Conclusion

The study explored the role of physical distance in client-counsellor interaction in sex counselling sessions at Nigerian universities. Findings suggest that optimizing physical distance does not significantly improve client-counsellor interaction outcomes. This indicates that other factors, such as cultural norms, client comfort, and therapeutic techniques, may play a more significant role in determining interaction outcomes in Nigerian university settings.

Recommendations

Based on the study's findings, it is recommended that when interacting with clients in sex counselling sessions, counsellors should focus on creating a comfortable and culturally sensitive therapeutic environment, rather than solely focusing on optimizing physical distance; counsellors should adjust physical distance according to client preferences and cultural norms, rather than adhering to a one-size-fits-all approach; counsellors should focus on developing effective therapeutic techniques and considering cultural factors that promote strong client-counsellor relationships and positive interaction outcomes; and counsellor training programs in Nigeria should emphasize cultural awareness, flexibility in therapeutic approaches, and attention to client comfort and preferences. These recommendations can help improve client-counsellor interaction outcomes in sex counselling sessions at Nigerian universities and promote effective counselling practices.

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Assessment on Integration of Idoma Language among Public Lower Basic Education Schools in Benue State, Nigeria

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Abstract

This study investigated the assessment on integration of Idoma language among public lower basic education schools in Benue state, Nigeria. The research set out to determine the extent of implementation of Idoma language as a medium of instruction and communication in the primary schools. It also sought to survey the attitude of the Idoma people towards the knowledge and use of the language for communication. The instrument for the study was a questionnaire. Seven research questions were raised. Through a proportional random sampling technique, forty-five (45) primary schools consisting of five (5) primary schools each from the nine Local Government Areas were randomly selected for the study. The results indicated that the extent to which Idoma language is used as a medium of instruction at the lower primary school is significantly low. The study revealed that the availability of materials for the teaching of Idoma language in the lower primary schools within the Idoma community is relatively significant. The research findings showed results that there is a prolific use of the Idoma language in the social and cultural life of the Idoma people within the Idoma nation. It was recommended that there is the need for increase awareness by drawing attention to its fragility (the Idoma language), value and the need for its transmission to children in the school and homes. It is essential that parents speak to their children in their native tongue and insist on it being spoken back.

KEY WORDS: *Idoma language, medium of instruction and communication, lower basic education.*

Introduction

The Nigerian government in November 2025 reversed the 2022 Nigerian language policy that stipulates from Early Childhood to Primary 6 mother tongue education or the language of the immediate community as the language of instruction (NLP, 2022). The Federal government argued that the decision to cancel is as a result of an extensive and data driven research that showed evidence that the use of mother tongue, as the initial medium of instruction in primary school, have negatively impacted learning outcome in many parts of the country. The resultant effect, as asserted by the Nigerian government, is mass failure in external examinations like the Senior School Certificate Examinations (SSCE), National Examinations Council (NECO) and Joint Admission and Matriculation Examination (JAMB). Conversely, citing global best practices and drawing examples from countries like China, Japan and India, which have made major strides in science and technology in recent times, while maintaining indigenous languages as language of instruction and education, Kano State House of Assembly in Nigeria, adopted Hausa language as a language of instruction in Kano State. The argument forwarded is that the framework would lay a stronger foundation for learning and make complex subjects like science and technology easier for pupils to grasp and equally strengthen foundational learning and preserve the linguistic and cultural heritage of the people (KSHA, 2025). The argument advanced by the Kano State House of Assembly points to the notion that language plays a significant role in shaping perception, identity and the understanding of the world around us. Identity, which may be distinctive, can be shaped, formed and enhanced by the language people speak (Sani & Abdullahi, 2020). Yet, out of the numerous extant languages in the world, only a few are constantly being reengineered and revitalized (De Costa, 2021). The rest may be considered moribund and in danger of extinction (UNESCO, 2020). This is a worrisome situation especially when a language like the Idoma language, and other small indigenous languages in Nigeria, is placed on the scale of time and weighed using such standardized parameters like orthography, spread, material development, numeration system, degree of usage by speakers and other ethnic groups, market value, degree of attractiveness, etcetera.

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Agreeable, the issue of language provokes a lot of sentiment because for native speakers of any language, their first language often shapes their world values and worldviews (Norton, 2013). For most indigenous people around the world, their language is an integral, vital and unquestionable part of their culture and identity (Wright & Richardson, 2019; Sani & Abdullahi, 2020). This assertion underscores the Sapir-Whorf Hypothesis that language has the power to influence peoples' world-view; and language is a guide to reality, shaping thoughts and providing the context through which their world is viewed (Regier, T. & Xu, Y., 2017). The Idoma language of Benue state, Nigeria, like other smaller indigenous languages in Nigeria, is still grabbling with relevance, material development and usage at schools, attractiveness and other internal and external factors militating against its implementation, as the language of instruction, especially at the lower primary schools within the Idoma community (Sahraei & Karami, 2020; Akintunde & Akuta, 2021). The new policy, without contradiction, will be detrimental to the growth and revitalization of the Idoma language. Furthermore, from available literature, a child, who has not fully mastered their mother tongue, and where language learning has not been firmly established in their mind, will not be in an optimal condition for learning a second language (Mahmoudi & Kavousi, 2023). Learning a second language under these circumstances may lead to speech difficulties and confusion in the child's thoughts (Mahmoudi & Kavousi, 2023). For this reason, mother tongue-based education, particularly in primary education, plays a crucial role in facilitating the child's learning process. It not only strengthens the child's grasp of the mother tongue but also lays a solid foundation for the later acquisition of a second language. It is pertinent to emphasize that the language policy statement (FGN, 2022) restate the need for every child to be taught in a mother tongue medium at the primary level since pupils learn better in their mother tongue. The policy also seeks to develop adequate instructional materials, training of qualified teachers for teaching indigenous languages with a focus on cultural preservation. Generally, the policy aims to balance the promotion of indigenous languages with a practical need for English language. However, English language would continually be used as the official language in later education and for formal communication.

Objectives of the Study

1. To determine the extent of implementation of Idoma language as a medium of instruction and communication in the primary schools;
2. To find out if there were materials for teaching Idoma language in schools particularly at the primary level;
3. To ascertain the use of the language in the media, social functions and homes;
4. To survey the attitude of the Idoma people towards the knowledge and use of the language for communication;
5. To ascertain if the educated Idoma people could read and write in the language;
6. To determine the existing works on Idoma language development; and
7. To find out if Idoma language is explored through the Idoma culture and arts.

Research Questions

1. To what extent was Idoma language used as a medium of instruction at the lower primary school?
2. What are the materials available for teaching Idoma language in the schools?
3. To what extent was Idoma language used in the media (Radio, Television, Newspaper) and homes?
4. What was the attitude of the Idoma people towards the knowledge and use of the language?
5. To what extent was Idoma language used in social functions?
6. What was the level of use of Idoma language in public and educational institutions?
7. To what extent was the Idoma language expressed in cultural life and arts?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

H_{o1}: There will be no significant difference in the use of Idoma language as a medium of instruction at the lower basic education schools.

H_{o2}: There are no available materials for teaching Idoma language in the lower basic schools

H_{o3}: There will be no significant difference in the use of Idoma language in the media and at home.

H_{o4}: There will be no significant difference in the attitudinal disposition of Idoma speakers towards the Idoma language.

$H0_5$: There will be no significant difference in the use of Idoma language at social function.

$H0_6$: There will be no significant difference in the use of Idoma language in public and educational institution

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$H0_7$: There is no significant difference is the use of Idoma language in cultural life and arts.

Methodology

Survey research was employed. The survey covered the nine (9) Idoma Local Government Areas of Benue state. Headmasters and teachers of primary schools within the nine Local Government Areas were the target population. Through a proportional random sampling technique, forty-five (45) primary schools consisting of five (5) primary schools each from the nine Local Government Areas were randomly selected for the study. The instrument for the investigation was the questionnaire. The questionnaire had a four (4) point Likert scale. The respondents were asked to circle the appropriate alphabet that tallies with their choice of answer from the alternatives provided. The questionnaire was divided into four sections with each of the sections requiring specific information related to the investigation. The data gathered were analyzed using the descriptive statistics i.e. the mean scores, why the hypotheses were analyzed using one-sample t-test, paired t-test and independent sample t-test.

Presentation of Results

Research Question 1: To what extent is Idoma language used as a medium of instruction at the lower primary school

Table 1: Extent to which Idoma language is used as a medium of instruction at the lower primary school

S/N	ITEMS	VHE(4)	HE(3)	ME(2)	LE(1)	Mean	DECISION
1	Idoma language was used by teachers to explain lessons in lower primary classes.	24	78	102	66	2.2	Low Extent
2	Pupils were taught basic literacy skills (reading and writing) using Idoma language.	68	108	48	48	2.7	High Extent
3	Teachers frequently combined Idoma language with English during classroom instruction.	48	42	78	102	2.1	Low Extent
4	Idoma language was officially encouraged as a medium of instruction in lower primary schools.	20	72	108	66	2.0	Low Extent
	Total Mean					**2.25**	**Low Extent**

Fieldwork, 2025

Based on the mean score computed on table 1 above, it was shown that the extent to which Idoma language is used as a medium of instruction at the lower primary level is low. This result is indicative of the partial use of Idoma language as a medium of instruction at the lower primary level in most of the schools within the Idoma nation.

Research Question 2: Are there materials available for teaching Idoma language in the schools?

Table 2: Extent of availability of teaching materials for Idoma language

S/N	ITEMS	Available(4)	Not Available(3)	Mean	DECISION
1	Textbooks written in Idoma language were available in the school	221	98	3.0	Available
2	Charts, posters, and visual aids in Idoma language were used during lessons.	90	180	2.1	Not Significant
3	Audio or recorded materials in Idoma language were available for teaching.	54	216	2.0	Not Significant
4	There are written Idoma literatures	204	66	3.0	Available
	Total Mean			**2.5**	**Available**

Fieldwork, 2025

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Table 2 above shows the mean value of 2.5, which is availability of teaching materials. The result is therefore indicative of the availability of materials for the teaching of Idoma language in the lower primary levels within the Idoma community. The availability of textbooks written in Idoma language in the school that will help facilitate teaching and learning in Idoma language were shown to have high mean value which translates to availability and accessibility.

Research Question 3: To what extent was the Idoma language used in the media (Radio, Television, Newspaper, internet) and homes?

Table 3: Extent of Idoma language usage in the media

S/N	ITEMS	VHE(4)	HE(3)	ME(2)	LE(1)	N	Mean	DECISION
1	Idoma language was commonly used in radio programmes within the community.	90	114	36	30	270	3.0	Very High Extent
2	Television programmes were broadcast in Idoma language.	102	84	24	60	270	3.5	Very High Extent
3	Newspapers or printed materials were published in Idoma language.	24	72	126	48	270	2.3	Low Extent
4	Parents and children communicated regularly in Idoma language at home.	160	72	10	24	270	3.6	Very High Extent
	Total Mean						**3.1**	**Very High Extent**

Fieldwork, 2025

Table 3 above shows the extent to which the Idoma language is used in the media and homes. The overall average mean response is 3.1, which is very high. The result therefore indicates that the extent to which Idoma language is used in the media and at homes is considerably very high.

Research Question 4: What is the attitude of the Idoma people towards the knowledge and use of the language?

Table 4: Attitudinal disposition towards language use by the Idomas

S/N	ITEMS	SA(4)	A(3)	D(2)	SD(1)	FX	N	ẋ	DECISION
1	Parents prefer their children to learn and speak English to Idoma	66	132	54	18	786	270	2.9	Agreed
2	Parents do not speak Idoma to their children at home	48	66	90	66	636	270	2.4	Disagreed
3	Parents encourage their children to read and write in the Idoma language	0	48	84	138	444	270	1.7	Disagreed
4	Educated Idoma sons and daughters can read and write in Idoma	18	42	78	132	486	270	1.8	Disagreed
5	The use of Idoma during school hours by pupils for communication and interaction is encouraged by teachers.	13	33	97	127	472	270	1.7	Disagreed
	Total Mean							**2.1**	**Disagreed**

Fieldwork, 2025

Table 4 above shows the analysis of the mean score with respect to the attitudinal disposition of the Idoma people towards the knowledge and use of the Idoma language. The average mean value is 2.1, which is disagreed. The result indicates that parents and teachers are not disposed positively to their children speaking and learning Idoma language when compared to the English language.

Research Question 5: To what extent is Idoma language used at social functions?

Table 5: Extent of use of Idoma language at social functions

S/N	ITEMS	VHE(4)	HE(3)	ME(2)	LE(1)	N	Mean	DECISION
1	The Idoma language is used in traditional ceremonies and social gatherings, such as weddings,	99	171	0	0	270	3.7	Very High Extent

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	funerals, festivals, tribal and communal meetings.							
2	The Idoma language is used in the community churches	150	84	36	0	270	3.4	Very High Extent
3	The Idoma language is used in the market place within the Idoma community.	72	156	36	6	270	3.1	Very High Extent
	Total Mean						**3.4**	**Very High Extent**

Fieldwork, 2025

Table 5 above shows the extent to which Idoma language is used at social functions. The average mean value is 3.4, which is very high extent. The result therefore indicates a high tendency of the use of the Idoma language at social functions within the Idoma nation.

Research Question 6: What is the level of use of Idoma language in public and educational institutions?

Table 6: Extent of use of Idoma language in public and educational institutions

S/N	ITEMS	VHL(4)	HL(3)	ML(2)	LH(1)	N	Mean	DECISION
1	The primary school pupils are allowed to speak Idoma language in school	111	79	61	19	270	3.0	High Level
2	The primary school pupils can read and write in Idoma language	0	0	120	150	270	1.4	Low Level
3	There are teacher training schools that teach Idoma language as a subject and course of study	120	84	48	18	270	3.1	Very High Level
4	Literacy in Idoma language is enforced at the lower primary level	29	48	133	60	270	2.2	Low Level
	Total Mean						**2.4**	**Low Level**

Fieldwork, 2025

Table 6 above shows the level of use of Idoma language in public and educational institutions. The average mean value stands at 2.4, which is considered not significant. The result indicates that the extent of use of Idoma language in public and educational institutions is significantly low.

Research Question 7: To what extent is the Idoma language expressed in cultural life and arts?

Table 7: Extent of Idoma language expressed in cultural life and arts

S/N	ITEMS	VHE(4)	HE(3)	ME(2)	LE(1)	N	Mean	DECISION
1	Idoma language was used in traditional songs and music.	127	143	0	0	270	3.5	Very high extent
2.	Cultural dances and performances were presented in Idoma language	120	130	7	3	270	3.7	Very high extent
3	Storytelling and folktales were commonly narrated in Idoma language.	34	20	132	84	270	2.3	Moderate extent
4	Idoma language was used in local drama, poetry, and artistic expressions.	24	30	150	66	270	2.1	Low extent
	Total Mean						**2.6**	**Very high extent**

Fieldwork, 2025

Table 7 above shows that the average mean value of the extent of use of Idoma language in cultural life and arts is significantly high with an average mean value of 2.6. This result indicates that there is a prolific use of the Idoma language in the social and cultural life of the Idoma people within the Idoma nation.

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Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

$H0_1$: There will be no significant difference in the use of Idoma language as a medium of instruction at the lower basic education schools.

One-Sample t-Test

Test Value = 3	t	df	Sig. (2-tailed)	Mean Difference
Overall Use	27.5	269	.000	0.80

Interpretation: t(269) = 27.5, p < .05 → Reject H_0. Use of Idoma is significantly higher than moderate.

$H0_2$: There are no available materials for teaching Idoma language in the lower basic schools

One-Sample t-Test

Test Value = 3	t	df	Sig. (2-tailed)	Mean Difference
Overall Use	-32.3	269	.000	-0.85

Interpretation: t(269) = -32.3, p < .05 → Reject H_0. Materials are significantly less than adequate.

$H0_3$: There will be no significant difference in the use of Idoma language in the media and at home.

Paired t-Test

Paired Difference	Mean	Standard Deviation	t	df	Sig. (2-tailed)
Home Media	1.30	0.50	.25.6	269	000

Interpretation: t(269) = 25.6, p < .05 → Reject H_0. Idoma is used more at home than in media.

$H0_4$: There will be no significant difference in the attitudinal disposition of Idoma speakers towards the Idoma language.

One-Sample t-Test

Test Value = 3	t	df	Sig. (2-tailed)	Mean Difference
Overall Use	34.4	269	.000	1.18

Interpretation: t(269) = 34.4, p < .05 → Reject H_0. Positive attitude is significant.

$H0_5$: There will be no significant difference in the use of Idoma language at social function.

One-Sample t-Test

Test Value = 3	t	df	Sig. (2-tailed)	Mean Difference
Social Function	17.0	269	.000	0.70

Interpretation: t(269) = 17.0, p < .05 → Reject H_0. Use at social functions is significantly above moderate.

$H0_6$: There will be no significant difference in the use of Idoma language in public and educational institution

Independent Sample t-Test

Test Value = 3	t	df	Sig. (2-tailed)	Mean Difference
Equal variances assumed	4.9	268	.000	0.70

Interpretation: t(268) = 4.9, p < .05 → Reject H_0. Schools use Idoma more than public offices.

$H0_7$: There is no significant difference is the use of Idoma language in cultural life and arts.

One-Sample t-Test

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Test Value = 3	t	df	Sig. (2-tailed)	Mean Difference
Cultural life	28.3	269	.000	1.00

Interpretation: $t(269) = 28.3$, $p < .05 \rightarrow$ Reject H_0. Use in cultural life and arts is significantly high.

Discussion of Findings

The importance of the mother tongue language policy is not in doubt. It is imperative that all stakeholders involved in the implementation should have a clear-cut perception of what the language policy entails in order that the targeted indigenous children access the derivable advantage. To this end, from research finding, the extent to which the Idoma language is used for instruction is found to be significantly low. Idoma language is not widely used as a medium of instruction in primary schools. Rather, English is commonly used as the medium of instruction, with the Idoma language complementing where there is need for clarification. What obtains is a bilingual education with a mix of Idoma language and English language. This may account for mass failure in some relevant external examinations written by the pupils. The finding is in agreement with Olagbaju & Akinsowun (2014) who offered a useful dimension to the argument. They contend that the use of the mother tongue in education is not simply an academic posture but a distinctive requirement. Students instructed in English, as opposed to their mother tongue, often struggle with the double challenge of comprehending a foreign language used as the medium of instruction and navigating the difficulties of the concepts being communicated. This double challenge can hinder effective learning and may contribute to differences in learning outcomes. Akintunde & Akuta (2021) concurred with Olagbaju & Akinsowun (2014) assertion by stating that not teaching in the mother tongue in the lower primary school is equivalent to holding learners under water without teaching them how to swim.

It is true that instructional materials are very key and important for the teacher in teaching his subject content for an effective teaching and learning process. The lack of appropriate instructional materials will render the teaching process ineffective and the teacher handicapped. The research finding show an average mean value of 2.5, which, from the research parameters, is statistically high. A result suggesting availability of teaching materials for teaching Idoma language in the lower primary schools. This finding is in agreement with Sahraei & Karami (2020) asserting that the proper implementation of mother tongue-based education requires careful planning and execution, such as identifying language models, employing and training teachers proficient in the mother tongue, designing and producing educational materials. These, they concluded, are among the most important fundamentals for the effective implementation of mother tongue-based education. This research finding however do not preclude the fact that more institutional support is still needed to be done in order to improve on the declining state of mother tongue education within the Idoma nation. The Idoma language is used in various forms of the media, although research finding shows that the degree of usage is not significant. This is probably due to limited coverage in relation with the numbers of speakers of Idoma language compared to more widely spoken languages in Nigeria. The use of the Idoma language in the homes is also a cause for concern, from the research finding, especially among younger generations. This is largely due to the influence of English language and a shift in perception. This finding tends to be in agreement with Yusuff & Osunnuga (2019) who found that many young people and adults could not read in their indigenous language. Most, especially the youths, they contend, shy away from speaking their indigenous languages; they see it in a derogatory light rather than a form of identity and pride.

The attitudinal disposition of the Idoma people towards the knowledge and use of the Idoma language is not encouraging. The average mean value is 2.1 from research finding, which is significantly low. The result indicates that parents and teachers are not disposed positively to their children speaking and learning Idoma language when compared to the English language. Research finding suggest that parents appreciate the advantages of mother-tongue education, but may prioritize English language due to its perceived importance. Teachers' attitudes and perception are equally negative. Only a few, from research finding, indicate a slightly positive disposition towards using Idoma language as a medium of instruction. Omotolani (2020) aptly captured the expressed negative attitude towards the indigenous language by expounding that parents hardly speak their mother tongue to their children any longer and most children are prohibited from speaking in their indigenous languages in public places, schools and even at home. Since only the older people use mother tongue, an entire generation of indigenous children can no longer communicate effectively with their parents in the Idoma language.

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There is however, a high disposition to the use of Idoma language at social functions within the Idoma nation. The Idoma language is widely used at social functions and serves as a vital link for communication, ceremonial activities, trade and commerce within the Idoma nation. According to UNESCO (2020), there is a considerable risk of the extinction of some languages due to the dominance of other languages, especially when speakers move away from utilizing their mother tongue informally: in social context and in informal education. The lack of transmission or effective usage of a language is considered as the main reason for language extinction. Thankfully, the Idoma language, from research finding, is commonly used at social functions albeit a looming disquieting language shift to English.

From the research finding, the extent to which Idoma language is used in public and educational institutions is significantly low. There are however, significant efforts by some public and educational institutions in the state to promote the study of Idoma language; the effort is yet to produce significant result. While Idoma is a stable language for the ethnic community and some bilingual materials exist, research show a strong preference for English in educational settings and other public domains, indicating a trend in language shift. Traditionally, at the lower primary level of schooling, Idoma language was used as a medium of instruction, with primers developed for teaching and learning the language. However, this practice is gradually being overtaken with the use of English as the predominant medium of instruction. With the domineering status of English language as the official language and the reversal of the 2022 National Language Policy, the choice of language of instruction becomes a little more complex with respect to interaction at the lower level of the primary schools. However, most non-formal discourse takes place in Idoma language. This research position is in agreement with Salawu (2012) assertion that declining acceptance and learning in indigenous languages is a clear deficiency among most Africans, a dilemma that affects several ethnic groups through Africa and it is one of the pungent residues of colonization, which inherently affects educational outcomes. The Idoma language is deeply expressed in the cultural life and arts of the Idoma people, playing a significant role in their traditional practices and daily life. The Idoma language is rich in proverbs and idioms. The language equally have a rich cultural heritage, which is found in the various festivities within the Idoma nation: Eje Alekwu, Inquest performances and funeral rites, naming ceremony, fishing and hunting expedition, crafts and arts. Therefore, as averred by Nishanthi (2020), the instructional use of the mother tongue is the greatest strategy to preserve an indigenous culture. Mother tongue benefits are significantly tied to indigenous culture. WaMbaleka (2014) concurred by rhetorically asking whether it is possible for one to identify with his culture without speaking the mother tongue.

Conclusion

Extant researches have shown that children first learn to express themselves through their mother tongue or indigenous language. The indigenous language becomes the foundation that the child builds knowledge, identity and initial worldview. Therefore, when the language of instruction is the same with the mother tongue or indigenous language, learning becomes much easier for pupils to grasp concepts in science and technology, and equally strengthen foundational learning and preserve the linguistic and cultural heritage of the people.

Recommendations

Deriving from the finding of the study as revealed by the data analyzed, the following are therefore, suggested as recommendations.

i. There is the need for increase awareness by drawing attention to its fragility (the Idoma language), value and the need for its transmission to children in the school and homes. It is essential that parents speak to their children in their native tongue and insist on it being spoken back.
ii. In view of the importance of the use learning materials and teaching aids in teaching and learning, it is therefore recommended that materials, appropriate teaching aids and learning paraphernalia be made available through concerted community engagement, government agencies, in order enhance the effective implementation of mother tongue education.
ii. Radio and television broadcasts in mother tongue are highly desirable if the relevance and status of the language is to be maintained. Printed materials in indigenous languages are important for both the adult and children.
iv. There is the need for a conscious attitudinal change by parents, teachers and the general community towards Idoma language. A positive attitudinal disposition will go a long way in rebranding and revitalizing the language. Jingles that elicit nationalist attitude should be encouraged.

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v. Within the Idoma nation, the mother tongue should be the acceptable language of communication and expression at all social and political functions. Especially at the lower primary schools.
vi. Public enlightenment campaign aimed at informing and creating public awareness about the need to learn and use the mother tongue should be embarked upon. Quizzes, public debate, essay competitions in schools, research and development of the language should be encouraged in educational institutions.
vii. The prolific use of the Idoma language in cultural life and arts should be sustained and enhanced.

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Effects of ChatGPT-Based Instruction Using VARK Model on Academic Performance in Cellular Respiration among Secondary School Students in Zamfara State, Nigeria

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Abstract

The study investigated the effects of ChatGPT-based instruction using VARK model on academic performance in cellular respiration among secondary school students in Zamfara state, Nigeria. Two objectives, two research questions and one hypothesis guided the study using explanatory sequential mixed method research design. The population was all the 98,417 senior secondary school students for the 2024/2025 academic session in the state. Sample was 93 students for both the quantitative and qualitative phases. Three validated instruments: Visual, Aural, Read/write and Kinesthetic Questionnaire (VARKQ), Cellular Respiration Performance Test (CRPT) and Biology Students' Perceptions on ChatGPT-based Instruction Interview (BSPCII) were used for data collection. Test-retest method was adopted in establishing the reliability of the VARKQ, CRPT and BSPCII using Cronbach's Alpha, Pearson's r and Cohen's Kappa correlations which yielded reliability indices of 0.81, 0.82 and 0.79 respectively. Quantitative data were analyzed using mean and standard deviation to answer the research questions and One Way ANCOVA to test the hypothesis at $p \leq .05$ significance level while the qualitative data were analyzed thematically. Findings revealed that: the mean academic performance score of the experimental group was greater than that of the control group and secondary school biology students' perceptions on the use of ChatGPT in learning were positive. The study concluded that ChatGPT-Based Instruction using VARK Model (CBIVM) significantly enhances students' academic performance and was perceived positively by the students. It was recommended that biology teachers should adopt the CBIVM and senior secondary school students should be encouraged to make better utilization of ChatGPT for personalized learning.

Keywords: ChatGPT, Model, Academic Performance Cellular Respiration

Introduction

Biological knowledge offers multifaceted and highly significant roles that impact the universe and all living matters existing on earth from time immemorial to the future. It has contributed tremendously to financial, physical and aesthetic benefits of mankind and to nation-building (Adekali, 2023). However, despite the importance of biology, statistics of grades obtained by biology candidates in the West African Examinations Council (WAEC) examination in recent years have not been encouraging (Nwagbo, 2019; WAEC Chief Examiner's Reports, 2021-2023). That is why biology is losing its might in academic performance of students in post-primary institutions (Ekineh and Otuturu, 2024). Biology is a very vast branch of science with diversified branches and topics like botany, zoology, microbiology, anatomy, physiology, genetics, biochemistry, biotechnology, cytology and cellular respiration. Cellular respiration is one of the most important topics in biology and that students learning biology without a basic understanding of cellular respiration will find it difficult to study other topics in biology. According to Dam et. al. (2019), respiration is the process by which complex food substances are broken down, in a stepwise series of reactions, in cells, to produce energy with carbon dioxide and water as waste products. Dam et. al. (2019) explained the three main stages of cellular respiration: glycolysis, the citric acid cycle, and oxidative

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phosphorylation. Glycolysis is a process by which glucose is broken down into pyruvate in the cytosol, producing a small amount of ATP and NADH. Citric acid cycle (Krebs cycle) is the process by which pyruvate is converted into acetyl-CoA, which enters the citric acid cycle. This stage produces more ATP, NADH, and FADH2 as byproducts. Oxidative phosphorylation refers to the process by which electrons from NADH and FADH2 are passed through the electron transport chain, generating a proton gradient. This gradient is used to produce ATP through the process of chemiosmosis. Cellular processes and genetics are complex concepts that can prove difficult to grasp solely through traditional teaching methods. Cellular respiration is also identified among the perceived difficult topics in senior secondary school biology curriculum in Zamfara state (Isma'il and Matazu, 2024). It is so wide with varied abstract contents or ideas that could best be taught using student-centered instructions like the CBIVM in which the instructional tool is mainly ChatGPT.

ChatGPT stands for chat Generative Pre-trained Transformer (GPT). It is an AI chatbot that was developed by OpenAI and was initially released on 30th November, 2022 based on GPT-3.5 and updated on 14th March, 2023 based on GPT-4. It is considered as the most powerful AI tool ever created (Rudolph et. al., 2023). It is able to comprehend and respond to a variety of prompts with a high level of expertise and carry on a continuous dialogue with the user. This is among the reasons why it was selected and used in this study. Humans and machines can collaborate and work together like in the ChatGPT scenario (Longo et. al., 2020). It has amazed the world with its extraordinary ability to perform extremely complex tasks (Baidoo-Anu and Owusu-Ansah, 2023). The strength of ChatGPT lies in its ability to interact through natural conversation, including a series of questions from the user and feedback from the application (Rospigliosi, 2023). Teaching and learning practices are never left behind by the ChatGPT effects in many aspects and levels of education. However, the emergence of ChatGPT has aroused diverse views among educators because its potential applications could revolutionize existing educational approaches (Tlili et. al., 2023). While some educators have expressed concerns about integrating ChatGPT into educational settings, many others present strong arguments in favor of its incorporation (Halaweh, 2023). The use of ChatGPT, with its positive and negative impacts on education, is still in its infancy and that implies the need for more empirical researches. ChatGPT could best be utilized in education using appropriate models like the Visual, Aural, Read/Write and Kinesthetic (VARK).

VARK model is a teaching model which mainly focuses on students' learning styles advocating that individuals learn best when taught based on their preferred styles of acquiring and assimilating knowledge. Learning styles refer to the different ways in which individuals prefer to acquire, process and retain information (Matazu and Ismail, 2023). One of the popular learning style models is the VARK model, which suggests that learners have different preferences in knowledge acquisition (Padmalatha and Shamanewadi, 2022). The concept of VAK learning styles was first coined by Neil Fleming in the late 1987 which was later modified to VARK in 2006. The model classifies students/learners into four, according to their sensory modalities on how they choose to have information submitted to them (Ismail and Haniff, 2020). For those who do not know which type/class they belong, they can answer the VARK questionnaire which consists of sixteen questions and the result represents which type among the four styles they truly belong to. Agu et. al. (2021) visual learners prefer visual aids such as diagrams and illustrations, auditory learners prefer verbal communication like lectures and podcasts, read/write learners prefer written texts, while kinesthetic learners prefer hands-on activities. Academic performance is defined as the extent by which learners perform in the lesson taught or examination result. It is affected by many factors such as retention, student ability, the quality of secondary education received and teaching method (Gachi, 2024). Some studies (Oladehinde, 2023) have demonstrated that student's academic performance in senior secondary school certificate biology and other science subjects' examinations since eighties had remained poor. Adding that, a lot has been done to improve teaching of biology in secondary schools in Nigeria such as using different innovative teaching strategies, training and retraining of biology teachers, provision of laboratory equipment among others. In spite of all these, students continue to perform poorly in biology. This situation has created the need for more effective method. It then becomes necessary to explore the efficacy of alternative method of redressing this situation (Oladehinde, 2023). This is among the main reasons for carrying out the present study among secondary school students in Zamfra state. The prevailing poor outcomes of students' performance in biology every year in Senior School Certificate Examination (SSCE) is attributed to the instructional strategies employed by teachers being inappropriate (Segun & Akanbi, 2023). Predictive analytics, a

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prominent application of AI in modern science education, empowers educators and institutions to anticipate students' success, identify areas of improvement and intervene proactively to enhance learning outcomes (Johnson, 2021).

Aim and Objectives of the Study

The main aim of this study was to investigate the effect of ChatGPT-Based Instruction using VARK Model on academic performance in cellular respiration among secondary school students in Zamfara state. However, the specific objectives of the study were to:

1. investigate if CBIVM has relative effect on students' academic performance in cellular respiration; and
2. determine students' perceptions on the use of ChatGPT tool in learning cellular respiration.

Research Questions

1. Is there mean difference in academic performance scores of students taught cellular respiration concept with CBIVM and those exposed to conventional demonstration method in Zamfara state?
2. How does senior secondary biology students perceive the use of ChatGPT tool in teaching cellular respiration concept in Zamfara state?

Null Hypothesis

There is no statistically significant mean difference between academic performance scores of students taught cellular respiration concept with CBIVM and those exposed to conventional demonstration method in Zamfara state.

Research Methodology

To have a nuanced and comprehensive insight of the effect of ChatGPT's integration, the study adopted the Mixed Method research design of the Explanatory Sequential type (Olatunde-Aiyedun, 2024) which triangulates (Alneyadi and Wardat, 2023) and blends quantitative and qualitative research methods in a particular study. The design entails using quantitative method first followed by the qualitative method to explain the findings for deeper insights, comprehensive understanding, validity and reliability of the study. The design was appropriate for the study due to the fact that it allows for the collection and analysis of both numerical (quantitative) and observational or textual (qualitative) data to validate the findings and increase reliability of the study. It is also appropriate owing to the fact that each of the quantitative and qualitative approaches has both strengths and limitations (Cresswell, 2014) so the study could combine the strengths to develop a stronger understanding of the research problem and, as well, overcome the limitations of each approach. The explanatory sequential mixed method research design adopted in the study is illustrated in figure 1.

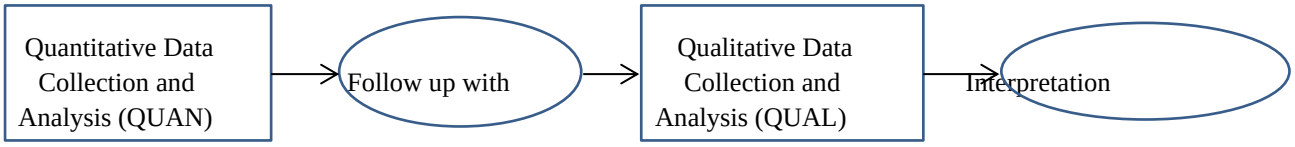

Figure 1: Illustration of the Explanatory Sequential Mixed Method Research Design Adopted in the Study
Source: Creswell (2014)

A. Quantitative Phase

Quasi-Experimental of the pretest-posttest non-equivalent control group design was adopted in this phase. The design is suitable for the study because: it is not possible for the researcher to conduct true experimental study due to lack of randomization of the participants/groups; intact classes (supported by the central limit theorem as noted by Turney, 2022) were used; and to avoid disruptions of the students' natural classroom settings in their respective schools. The design employs two distinct groups of participants (experimental and control). The pretest was used to establish equivalence and identify initial difference among the two groups and to control selection bias which may be a threat to the internal validity.

B. Qualitative Phase

Follow-up interviews were adopted in this phase. This is appropriate because qualitative data were harnessed from the sample in order to deeply explore, validate and explain the initial findings of the quantitative phase. It is also suitable as the qualitative data collection builds directly on the quantitative results obtained. Hence, the qualitative follow-up interview used the quantitative sample (experimental group exposed to CBI) where the qualitative data were collected through structured interview and analyzed thematically.

The total population of the study was all the 98,417 (61,784 male; 36,633 female) senior secondary school students for the 2024/2025 academic session in all the 339 senior secondary schools (both public and private) in Zamfara state while the target population was only the 30,805 (19,541 males; 11,260 females) SS2 students in the schools (National Association of Proprietors of Private Schools (NAPPS) Zamfara State Chapter, 2024; ZSMEST, 2024). As there were no public coeducational senior secondary school in the study area, Public-Private Partnership (PPP) coeducational senior secondary schools which share common characteristics with the public schools in the state were used to serve the purpose better. Multi-stage sampling procedure was used in selecting the study's sample in which cluster sampling was initially used in selecting two (2) out of the four (4) educational zones in the state. One (1) local government area (from each of the two selected educational zones) was randomly selected by balloting. Thereafter, purposive sampling (due to the need for mix-schools) was used in selecting one (1) PPP coeducational senior secondary school from each of the two (2) local government areas selected (these schools were coded as schools: "A" and "B" and were assigned as experimental group one and two respectively using simple random sampling by tossing coin. An intact class from each of the schools was finally selected using simple random sampling by balloting as the sample of the study. The two (2) intact classes with a population of 83 students and the 10 selected students for the interview formed the study's sample size of 93 students. Multi-stage sampling procedure was used because it was difficult for the researcher to carry out the study throughout the state and to avoid selection bias. Simple random sampling technique was appropriate due to the facts that it is scientific/probabilistic in which any school/student has equal chances of either being selected or deselected as part of the study's sample. The purposive sampling technique was suitable as the study involved gender as one of its variables which required the use of coeducational schools. For the qualitative phase of the study, simple random sampling by balloting was used in selecting ten (10) students (5 males and 5 females) from the experimental group exposed to CBIVM during the quantitative phase for the follow-up interview.

In the quantitative phase, two validated instruments were used for data collection as follows.

1. Visual, Aural, Read/Write and Kinesthetic Questionnaire (VARKQ)
2. Cellular Respiration Performance Test (CRPT)

In the qualitative phase, data were collected through follow-up structured interviews using the Biology Students' Perceptions on ChatGPT-Based Instruction Interview (BSPCII).

Prior to the commencement of the study the researcher ensured that the study complied with the ethical guidelines. On reaching to the schools, formal introductions were made in which the purpose of the study was explained to the school authorities, the students and their parents/guardians where informed consent forms were issued to them for approvals. On the consent form, information and assurance on their: voluntary participation; confidentiality/privacy/anonymity of their personal information and their schools; and strict utilization of the data for the study's purpose only were clearly stated and explained. In addition, a request for the noting of the interviews with hidden identities during the presentation of the results was also included. Thereafter, the respondents were coded accordingly and the data were collected via the procedure of pretest, treatment, posttest and post-posttest administrations of the research instruments. Students in the experimental and control groups were firstly subjected to a pretest of the instruments before the treatments. The researcher used the two distinct methods (CBIVM and Conventional Demonstration Method (CDM)) respectively in teaching the two different groups the concept of cellular respiration for a period of seven (7) weeks as treatment and placebo for both the experimental and control groups respectively during the normal biology periods in all the sampled schools. Students in the experimental group were firstly categorized into four (4) using the VARKQ. Thereafter, they were taught concept of cellular respiration with CBIVM, adhering strictly to the steps specified in its lesson plans. All the subjects in the control group were taught the same concept using the demonstration method also for seven (7) weeks, adhering to the steps in its lesson plans. At the end of the treatment, posttests of the instruments were administered to the same groups to determine the effect of the treatment. The data were then recorded as per the experimental and control groups for analysis. A week after the posttest session, the qualitative phase set in with a follow-up interview using the BSPCII to harness qualitative data from the selected students in the experimental group exposed to CBIVM.

The quantitative data were analyzed using descriptive and inferential statistics. Specifically, all the research questions and the null hypotheses were restated whereby the research questions were answered using mean and standard deviation and all the hypotheses were tested using One-Way ANCOVA at $p \leq .05$ level of significance. ANCOVA was appropriate for the hypotheses testing due to the presence of covariate (the pretest) and to remediate lack of randomization of participants

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and/or groups. IBM Statistical Package for Social Sciences (SPSS) Statistics Version 25.0 Software was used for the analysis. The qualitative data were analyzed using thematic approach (for the relevant aspects of the interview). The approach was used because it allows for the extraction of key insights and the identification of recurring themes within the narratives provided by the participants (Olatunde-Aiyedun, 2024).

Presentation of Results

Research Question One

Is there mean difference in academic performance scores of students taught cellular respiration concept with CBIVM and those exposed to conventional demonstration method in Zamfara state? To answer this research question, the students' posttest CRPT scores in the two different groups were analysed and the result is presented in Table 1.

Table 1:

Summary of the Result of Students' Posttest Academic Performance Scores Means and Standard Deviations in both Experimental and Control Groups

Group	N	Mean ($\bar{X}$)	SD	MD	Remarks
Experimental	47	17.26	3.72	6.09	Difference Exists
Control	36	11.17	1.98		
Total	83				

Source: Researcher's Fieldwork (2025)

Table 1 portrayed that the posttest academic performance scores mean and standard deviation of the experimental group were 17.26 and 3.72 respectively while those of the control group were 11.17 and 1.98 respectively. Hence, the mean difference between the groups was 6.09 and this result clearly indicated that the students taught using the CBIVM had higher mean academic performance score than those taught using the lecture method. That is, the experimental group performed better than the control group. However, by their respective standard deviations, the students' scores in the control group were more closely around the mean compared to those of the experimental group. Therefore, to determine whether the mean difference found was statistically significant or not, the corresponding null hypothesis one was tested.

Null Hypothesis 1

There is no statistically significant mean difference between academic performance scores of students taught cellular respiration concept with CBIVM and those exposed to conventional demonstration method in Zamfara state. The result of testing null hypothesis one is presented in Table 2.

Table 2:

Summary of One-Way Analysis of Covariance (ANCOVA) of SS 2 Students' Academic Performance Scores for both Experimental and Control Groups

Source	Sum of Squares	DF	Mean Squares	F	Sig.	Decision
Corrected Model	15245.594	4	3811.398	30.777*	.000	
Intercept	45302.745	1	45302..745	365.815*	.000	
Pre-test	31.0 12	1	31.012	0.250	.618	Not Sign.
Inst. Strategy	14469.023	1	14469.023	116.836*	.000	Sign.
Error	13993.974	113	123.840			
Total	424685.000	118				
Corrected Total	29239.568	117				

Source: Researcher's Fieldwork (2025) * = Significant at $p \leq 0.05$

Table 2 revealed that the instructional strategy (CBIVM) has significant effect on students' academic performance in the cellular respiration concepts studied. This is because as seen from the table, CBIVM is statistically significant at *P*-value of .000 and therefore it is also statistically significant at a higher *P*-value of .05. This led to the rejection of the null hypothesis that there is no significant difference between the mean academic achievement scores of secondary school

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students when taught cellular respiration using the multiple intelligence-based instructional strategy and those taught using the lecture method. Thus, there is a statistically significant difference between the mean academic performance scores of secondary school students taught cellular respiration concepts using CBIVM and those taught using conventional method of teaching in favour of the experimental group (F = 116.836*, df = 1 and p = .000 < .05). However, to specifically determine which of the four categories of learners (the VARK learners) under the experimental group had significantly higher academic performance among others, a pairwise comparison of Bonferroni's post-hoc test was further conducted and the analysis was presented in Table 3.

Table 3:

Summary of Bonferroni Post-hoc Analysis of Academic Performance of SS 2 Students in the Experimental Group Categories (VARK Learners) and Control Group

(I) Group	(J) Group	Mean Difference (I-J)	Sig.[b]	95% Confidence Interval for Difference[b]	
				Lower Bound	Upper Bound
V.L.	A.L.	8.33*	.000	6.58	11.95
	R.L.	7.42*	.000	-11.07	-4.26
	K.L.	5.19*	.000	-9.64	-7.83
	C.G.	12.45*	.000	8.46	14.44
A.L.	V.L.	-9.80*	.000	-12.35	-6.68
	R.L.	-4.17*	.000	-17.64	-12.07
	K.L.	-8.67	.000	-13.33	-10.81
	C.G.	6.55	.169	-.49	5.61
R.L.	V.L.	-7.56*	.000	5.20	10.27
	A.L.	6.68*	.000	14.04	19.25
	K.L.	-5.73	.000	7.99	8.79
	C.G.	8.01*	.000	15.69	21.73
K.L.	V.L.	-1.89*	.000	-11.35	-5.68
	A.L.	5.36*	.000	-16.64	-11.07
	R.L.	4.07	.000	-12.33	-11.81
	C.G.	10.11	.157	-.58	6.61
C.G.	V.L.	-12.45*	.000	-13.54	-7.62
	A.L.	-6.55	.158	-4.91	.52
	R.L.	-8.01	.000	-7.79	.48
	K.L.	-10.11*	.000	-15.73	-14.69

Source: Researcher's Pair-Wise Comparison * = Significant at $p \leq 0.05$

Key:

V.L.: Visual Learners Exposed to CBIVM A.L.: Auditory Learners Exposed to CBIVM
R.L.: Read/Write Learners Exposed to CBIVM K.L.: Kinesthetic Learners Exposed to CBIVM C.G.: Control Group Students Taught with CDM

The Bonferroni post-hoc analysis of the post-test mean academic performance scores in Table 3 revealed significant differences among the categories/groups. Visual Learners significantly performed better than Auditory Learners (Mdif = 8.33, p < .05), Read/Write Learners (Mdif = 7.42, p < .05) and Kinesthetic/Tactile Learners (Mdif = 5.19, p < .05). However, Kinesthetic/Tactile Learners outperformed both the Read/Write Learners (Mdif = 4.07, p < .05) and Auditory Learners (Mdif = 5.36, p < .05). The Control Group Students performed significantly lower than all the four experimental group categories: Visual Learners (Mdif = −12.45, p < .05), Auditory Learners (Mdif = −6.55, p < .05), Read/Write Learners (Mdif = −8.01, p < .05) and Kinesthetic/Tactile Learners (Mdif = −10.11, p < .05). Therefore, these showed that CBIVM was most effective for the Visual Learners, followed by the Kinesthetic/Tactile Leaners among the other experimental group categories and the control group.

Research Question Two

How does senior secondary biology students perceive the use of ChatGPT tool in teaching cellular respiration concept in Zamfara state? To answer this research question, the experimental group students' interview responses in the BSPCII were audio-recorded and transcribed, and the data were analysed thematically, allowing for the extraction of key insights and the identification of recurring themes within the narratives provided by the students. All the interviewees reported: "using

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ChatGPT in their cellular respiration classes" in which there were seven (7) positive and three (3) negative responses as follows.

Recorded and Transcribed Students' Interview Responses

Positive Views

1. Student 1**:** "ChatGPT helped me very well. It simply explained cellular respiration for me to understand easily. The examples it gave me were good."
2. Student 2**:** "It was like my teacher. I asked questions and it immediately gave me answers which helped me understand complex processes like glycolysis."
3. Student 4**:** "I liked how ChatGPT broke down the steps of cellular respiration. That made it much simpler to learn and remember."
4. Student 6: "The practice questions and quizzes were very useful. They helped me test my knowledge and retain information better."
5. Student 7: "ChatGPT's explanations were clear and simple. The summaries at the end of each lesson were very interesting."
6. Student 8: "I enjoyed the real-life examples it gave and how they related to cellular respiration. That made me more involved in the lessons. "
7. Student 10: "I felt happy that I could learn individually with ChatGPT. Its responses were always detailed and helpful."

Negative Views

1. Student 3: "Sometimes the explanations look somehow and I do not quickly understand. My teacher explains better for me."
2. Student 5: "I didn't like relying on a phone or computer for learning. I am use to my teacher teaching me directly."
3. Student 9: "ChatGPT is sometimes confusing me. Its answers were not always clear and straightforward for me."

Thematic Analysis

The main analysis was conducted following six (6) steps as follows.

Step 1: Familiarization

The students' responses clearly indicated a mixture of both positive and negative perceptions about using ChatGPT in learning cellular respiration. The ositive views highlighted its clarity, personalization, and effectiveness in understanding complex concepts, while the negative views pointed at preference for human interaction, impersonality and confusion.

Step 2: Coding

Codes for Positive Views

a. Clarity and simplicity of explanations - 1
b. Personalization and flexibility - 2
c. Effectiveness in understanding complex concepts - 3
d. Engagement through real-life examples - 4

Codes for Negative Views

a. Impersonality - 5
b. Confusion and lack of clarity - 6
c. Preference for human interaction - 7

Step 3: Theme Identification

Four distinct themes emerged from the codes as follows.

i. **Effectiveness in Learning:** this theme centered on ChatGPT's clarity, simplicity and effectiveness in understanding complex concepts.
ii. **Personalization and Flexibility**: this theme focused on the students' ability to learn at one's own pace and personalized responses.
iii. **Engagement**: this theme underscored ChatGPT's use of real-life examples and interactive nature.
iv. **Challenges and Preferences**: this theme capitalized on impersonality, confusion and preference for human interaction.

Step 4: Theme Development

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Effectiveness in Learning: Students found ChatGPT effective for understanding cellular respiration due to its clear and simple explanations. These included: Student 1**:** "ChatGPT helped me very well. It simply explained cellular respiration for me to understand easily. The examples it gave me were good." Student 4**:** "I liked how ChatGPT broke down the steps of cellular respiration. That made it much simpler to learn and remember." Student 7: "ChatGPT's explanations were clear and simple. The summaries at the end of each lesson were very interesting."

Personalization and Flexibility: The ability to learn at students' own pace and receive tailored responses was highly valued. These included: Student 10: "I felt happy that I could learn individually with ChatGPT. Its responses were always detailed and helpful." Student 2**:** "It was like my teacher. I asked questions and it immediately gave me answers which helped me understand complex processes like glycolysis." Student 6: "The practice questions and quizzes were very useful. They helped me test my knowledge and retain information better."

Engagement: Real-life examples and interactive nature of ChatGPT enhanced engagement. These included: Student 8: "I enjoyed the real-life examples it gave and how they related to cellular respiration. That made me more involved in the lessons." Student 1**:** "ChatGPT helped me very well. It simply explained cellular respiration for me to understand easily. The examples it gave me were good." Student 7: "ChatGPT's explanations were clear and simple. The summaries at the end of each lesson were very interesting."

Challenges and Preferences: Some students preferred human interaction and found certain aspects impersonal or confusing. These included: Student 3: "Sometimes the explanations look somehow and I do not quickly understand. My teacher explains better for me." Student 5: "I didn't like relying on a phone or computer for learning. I am use to my teacher teaching me directly." Student 9: "ChatGPT is sometimes confusing me. Its answers were not always clear and straightforward for me."

Step 5: Data Analysis

The analysis shows that while most students found ChatGPT beneficial for learning cellular respiration, some expressed concerns about its impersonality and clarity. This suggests the need for balancing the technology use (as a teaching resource or tool that complements human teaching) with human interaction so as to maximally leverage the technology's benefits while addressing its limitations.

Step 6: Interpretation

The findings indicated that ChatGPT can be a valuable tool for learning, offering personalized and engaging experiences. However, it is crucial to address the challenges and preferences for human interaction to ensure effective learning among senior secondary school students.

Discussion of Findings

The findings of the null hypothesis disclosed that there was statistically significant difference between the mean academic performance of the students taught cellular respiration using the CBIVM and those exposed to CDM in favour of those exposed to the CBIVM. This was indicated by the groups' mean difference and the result of the one-way ANCOVA analysis on the SS 2 students' mean academic performance in learning cellular respiration. Thus, it implies that exposing students to the CBIVM as an instructional strategy helps students learn and comprehend even the erroneously misconceived cellular respiration concept more easily than using the conventional method. This finding confirms those of: Alneyadi and Wardat (2023) who reported that ChatGPT had a positive influence on students' achievement and perception of learning in the field of electronic magnetism; Eltahir and Babiker (2024) whose findings underscored the transformative potential of AI-powered personalized learning tools in improving students' learning outcome; Mina et al. (2023) who revealed that AI virtual assistant allowed students to explore their potentials and helped them achieve academic tasks that are generally difficult; Salami (2023) who found that virtual learning had a positive impact on the performance of students as compared to traditional learning; and Udosen and Udoh (2024) who found that students taught biology using ChatBot AI outperformed those taught with traditional expository method. However, it contradicted the findings of Fadzil and Mahmud (2020) who found that no significant difference in the mean post-achievement scores between the treatment group and the control group who were taught using the conventional method. The findings of the second research question which was not subjected to hypothesis testing revealed that secondary school biology students' perceptions on the use of ChatGPT tool in learning cellular respiration was positive. This was indicated by the thematic analysis result on the experimental group students' interview responses which indicated that: SS 2 students found ChatGPT effective for understanding and performing in cellular respiration due to its clear and simple explanations (theme 1); SS 2 students had the ability to learn

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at one's own pace and learning style (theme 2); SS 2 students found ChatGPT comfortable, simple and user-friendly tool which offers real-life examples in an interactive nature for enhanced engagement (theme 3); and some few SS 2 students who preferred human interaction found certain aspects of ChatGPT impersonal or confusing (theme 4). These findings aligned with the prior research findings of: Betrancourt (2019b); Capinding and Dumayas (2024); Ismail and Lukman (2023) whose findings showed that students hold favourable perceptions concerning the utilization of online tools and resources in biology learning; and Lu et. al. (2020c) whose findings indicated that ChatGPT holds the potential to enhance students' learning outcomes through immediate feedbacks and personalized support; Szmyd and Mitera (2024) who revealed that AI-based tools are perceived by students as helpful in developing information analysis skills and constructing assignments. On the negative side, the findings confirmed those of Xu et al. (2019a) and Mayer (2014a) who reported the need to enhance ChatGPT's capabilities to better comprehend students' inquiries and the significance of providing visual aids to support learning.

Conclusion

By the findings of the study, ChatGPT-based instruction proved significantly effective in enhancing senior secondary school students' academic performance in learning cellular respiration in Zamfara state. This was because, significant improvements were observed in the academic performance of the experimental group students compared to those in the control group. Also, senior secondary school students' perceptions on the use of chatGPT in learning were positive.

Recommendations

Based on the findings of the study, the following recommendations were made.

1. Biology teachers should adopt the CBIVM in their teaching.
2. Senior secondary school students should be encouraged to make better utilization of ChatGPT for personalized learning.

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Comparative Assessment of Financial Assets and Equity on Bank Lending Rate among Deposit Money Banks in Nigeria

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Abstract

This paper examines the Comparative Assessment of Financial Assets and Equity on Bank Lending rate among Deposit money Banks in Nigeria. The research uses the qualitative approach to the study wherein secondary data sources like annual reports, financial statements, and related literature were used. The results indicate that adequate financial analysis can help credit risk management, and minimize the number of non-performing loans as well as to improve the loan evaluation of deposit money bank which will result in the better financial output. A set of key financial ratios, credit evaluation ratios, and lending results reveal that strategic applications of financial analysis provide the Deposit Money Bank, Nigeria with strength in its lending decisions and general profitability. For effective bank lending, this paper proposes the constant upgrading of modern financial analysis equipment and employees and equip them with capacity building. The paper would be beneficial to the literature as it seeks to shed light on the contribution of financial analysis as an important asset of risk prevention and successful lending in Nigerian banks.

Keywords: *Financial Analysis, Banks Lending, Credit Risk Management, Deposit Money Bank, Loan Assessment, Non-Performing Loans.*

Introduction

The banking industry highly depends on financial analysis in an attempt to maximize lending habits and control credit risks. Financial analysis is a current and relevant topic in Nigeria since the economic environment requires responsive measures created by the dynamics of business (Abubaka et al. 2019). Financial information is vital in determining the creditworthiness of the lender in an organisation; thus, affecting the quality of lending and financial performance of banks. Nigerian banking sector has been growing at a great pace and is undergoing a lot of reforms. Nevertheless, credit risk, non-performing loans, and capital adequacy are still among the dilemmas that are faced by this sector. Financial analysis, in turn, through the case of credit risk management has taken the stage in defining the stability and profitability of banks (Ajao and Ehi 2019).

Financial analysis is the most important tool used in deposit money banks in Nigeria to analyze the risks involved in lending using different tools and techniques. In addition, financial analysis helps banks in decision making when lending to individuals since the banks carry out analysis of the financial statements, ability to repay the loan as well as the economic climate of the business. The process promotes chances of loan recovery and alleviates the determine of bad debts which has traditionally damaged the profitability of banks in Nigeria, Akinselure and Abisola (2019). Consequently, banks should continuously

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advance their financial analyses framework in order to be able to stay afloat. Credit risk management has been associated with the financial soundness of the commercial banks around the world. (Alshatti, 2015) discovered that a good credit risk management enhances the profitability of the banks by diminishing loan losses as well as increasing the quality of the relevant assets. Although his research was dedicated to the case of Jordanian banks, those principles can be applied to the Nigerian reality, when banks are under the same threats of economic changes and shifts in the regulation conditions. In Nigeria, Deposit Money Bank, Nigeria are well established institutions with long histories relative to the delivery of financial services yet they still find issues with credit administration and loan quality portfolios, (Fatima, 2013). Such issues require effective financial analysis tools to counter the risk and to enhance lending success. Appropriate analysis can enable banks to customize loans to meet matters of their customers in terms of the finances that they can channel and hence inclusion and economic growth. The recent studies in Africa also focus on the effect of the credit risk to the performance of the commercial banks. As an example, Kwashie el at. (2022) examined Ghanaian banks and stated that credit risk management is an effective means that contributes to enhanced financial performance. These results illustrate the topicality of a tight financial analysis in the region as the measure of the experiment of efficiency of lending. Likewise, Majani (2022) also considered banks included in the Nairobi Securities Exchange and confirmed the existence of the positive correlation between financial outcomes and credit risk management. This implies that financial analysis can be of great help to banks in various African markets, such as Nigeria, in regulating their exposure to credit risk as well as maintaining profitability.

According to Molla (2018), Janata Bank Limited was also examined and it was concluded that an evaluation of loans using financial analysis has a direct impact on the performance of banks. These observations demonstrate the universal need of banks to focus on the financial examination in lending behaviors so as to achieve risk aversion and financial feasibility. Lastly, the review study by Olalere and Wan (2016) on risk management and financial performance in the cases of the Nigerian banks emphasizes that cohesive financial analysis models are necessary in handling credit risks. Their report suggests that there should be an on-going counteract of the current risk assessment techniques in order to make the Nigerian banks more resilient to market fluctuations and credit shocks. To sum up, financial analysis can be defined as the foundation of the successful lending activity of banks in Nigeria. With the deposit money banks in the era in economy of uncertainty, following advanced credit risk management and financial evaluating strategies will be essential in transforming the performance of loans and overall soundness of the organisation.

Statement of the Research Problem

Inadequate financial analysis leading to poor lending decision resulting in increased non-performing loans and decreased profitability in Deposit Money Bank, Nigeria. Such issues require effective financial analysis tools to counter the risk and enhance lending success. Appropriate analysis can enable banks to customize loans to meet matters of their customers in terms of the finances that they can channel and hence, inclusion and economic growth. Thereafter, the research or paper is needed to examine the impact of financial analysis as a tool for effective bank lending in Deposit Money Bank, Nigeria.

Objectives of the study

The main objective of the study was to analysed how financial statement components influence the bank lending rate volatility of deposit money banks in Nigeria. The specific objectives are to;

1. assess the effect of financial assets on bank lending rate volatility of deposit money banks in Nigeria;
2. analyze the relationship between financial equity and bank lending rate volatility of deposit money banks in Nigeria.

Research Questions

The study provides answers to the following research questions so as to achieve the research objectives.

1. To what extent does financial assets affect the bank lending rate volatility of deposit money banks in Nigeria?
2. What is the relationship between financial equity and bank lending rate volatility of deposit money banks in Nigeria**?**

Hypotheses:

The formulated hypothesis was tested on the significant level of 0.005

H_{01}. Financial assets does not have significant effect on the bank lending rate volatility of deposit money banks in Nigeria

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H02. Financial equity does not have significant relationship on bank lending rate volatility of deposit money banks in Nigeria

Research Design

Research designs are perceived to be an overall strategy adopted by the researcher whereby different components of the study are integrated in a logical manner to effectively address a research problem. In this study, the researcher employed the survey research design. This is due to the nature of the study whereby the opinion and views of people are sampled. According to Singleton & Straits, (2009), Survey research can use quantitative research strategies (such using questionnaires with numerically rated items), qualitative research strategies (such using open-ended questions), or both strategies (such mixed methods). As it is often used to describe and explore human behaviour, surveys are therefore frequently used in social and psychological research.

Population of the Study

According to Udoyen (2019), a study population is a group of elements or individuals, as the case may be, who share similar characteristics. These similar features can include location, gender, age, sex or specific interest. The emphasis on study population is that it constitutes individuals or elements that are homogeneous in description. This paper used qualitative research method where they mainly used secondary data focusing on the influence of financial analysis as an instrument towards effective lending by Deposit Money Banks in Nigeria. The option of qualitative research was selected due to the capability of this method to study complex financial concepts and ways of lending in depth by analysing and comprehending the existing information instead of collecting numerical data. The proposed research design was focused on the collection and analysis of ideas related to the findings that have been documented and scholarly studies used in the context of financial analyses and credit risk management in Nigeria banking industry. The sources of this research had been existing academic literature, official bank reports, regulations and credible articles on financial analysis, bank lending, and credit risk management, specifically in the case of the Deposit Money Bank, Nigeria or the deposit money banks in Nigeria at large. It included a purposive sampling method to select the sources that were published in the period of 2015 to 2025, so that the data on the issue represented modern field practices and problems in the bank sphere of investigation.

Sampling and Sample Size

The sample selection was carried out on the basis of relevance, credibility, and contribution to the topic of investigation. The data collection method consisted of a secondary source that was gathered via the general search of academic databases and online resources including ResearchGate, Google Scholar, JSTOR, and institutional repositories. The method of selection entailed screening of abstracts and full-text to come up with information that contained relevant studies, reports and analysis related to the subject under study that addressed financial analysis techniques, credit risk assessment, loan evaluation, and loan outcomes. During data extraction, emphasis was given to contents and conclusions that were relevant to the research questions, thus coverage of the subject matter was inclusive. Analytical procedure entailed the use of thematic content analysis which is a qualitative approach that would identify, code and categorize the main themes in the literature gathered. The method supported the composition of different views on the concept of financial analysis and contribution to efficient lending by banks. Such themes as credit risk management, loan performance, and difficulties of the banks in Nigeria were elaborated in order to order all the findings in accordance with them. In order to improve the rigor of the analysis, the study critically analyzed the validity and the reliability of the sources and compared the findings of all the different studies and noted the similarities and differences. This triangulation increased the strength of the conclusions that were made using the secondary data. Comprehensively, the methodology was adequate to carry out the study as a comprehensive and sensitive study with an aim of understanding the impact of the financial analysis on the performance of bank lending within the Nigerian banking context, especially on Deposit Money Bank, Nigeria.

Presentation of Results

Table 1: Lending Outcomes and Customer Satisfaction at Deposit Money Bank, Nigeria (2021-2024)

Outcome Indicator	2021	2022	2023	2024

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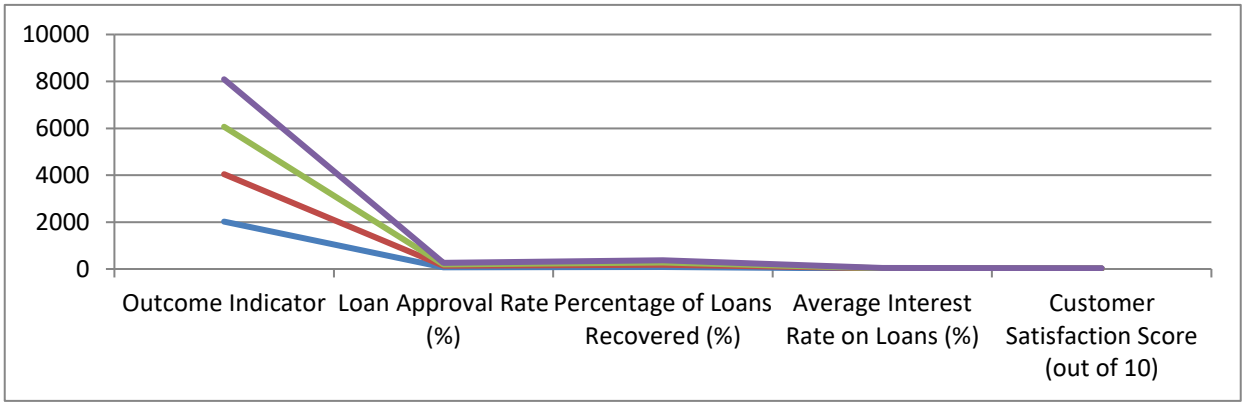
Loan Approval Rate (%)	68	65	63	60
Percentage of Loans Recovered (%)	89	91	93	95
Average Interest Rate on Loans (%)	12.5	12.2	11.9	11.5
Customer Satisfaction Score (out of 10)	7.8	8.1	8.4	8.7

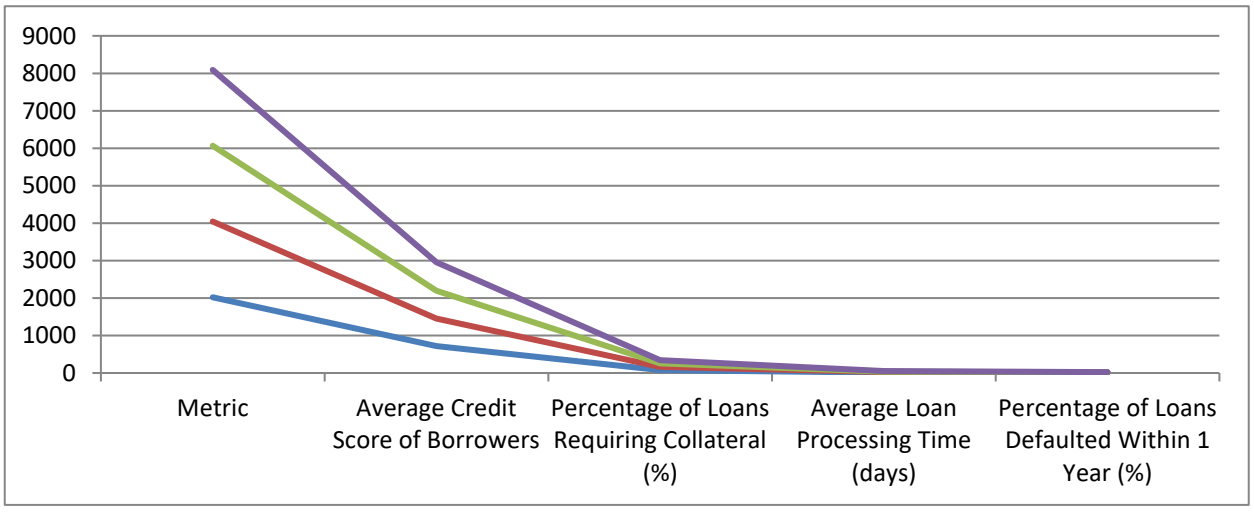


***Source**: Deposit Money Bank, Nigeria Customer and Lending Reports (2021-2024)*

The decrease in loan approval rate from 68% to 60% likely reflects stricter lending criteria, which may have been implemented to reduce credit risk after more thorough financial analysis. Increasing loan recovery rates from 89% to 95% suggest more effective loan monitoring and recovery strategies, contributing to improved asset quality. The gradual decline in average interest rates on loans from 12.5% to 11.5% could indicate growing confidence in borrower quality, allowing the bank to offer more competitive rates. Customer satisfaction scores improved steadily from 7.8 to 8.7, signaling better customer service, loan processing experience, and possibly trust in the bank's lending practices.

Table 2: Credit Risk Assessment Metrics at Deposit Money Bank, Nigeria (2021-2024)

Metric	**2021**	**2022**	**2023**	**2024**
Average Credit Score of Borrowers	720	735	745	760
Percentage of Loans Requiring Collateral (%)	82	85	88	90
Average Loan Processing Time (days)	14	13	12	10
Percentage of Loans Defaulted Within 1 Year (%)	7.0	6.1	5.4	4.7



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***Source**: Deposit Money Bank, Nigeria Credit Risk Reports (2021-2024)*

The increase in average credit score from 720 to 760 shows a more selective borrower evaluation process, reflecting the bank's effort to lend only to clients with stronger credit profiles. The growing percentage of loans requiring collateral from 82% to 90% demonstrates enhanced risk mitigation by securing loans against assets, a sign of tighter financial analysis protocols. The reduction in loan processing time from 14 to 10 days indicates improvements in operational efficiency, possibly due to better financial assessment tools and streamlined lending procedures.

Discussion of Findings

The research aimed to determine how financial analysis is important as a way of improving the success of decisions that the banks make in its lending process with a special emphasis on Deposit Money Bank, Nigeria. The results imply that stringent financial analysis enhances loan portfolios quality as it allows better evaluation of credit worthiness on the side of the borrower. This causes a decrease in the number of non-performing loans and improvement of financial performance of the bank. The slow move towards corporate lending, as well as the steady SME support is a strategic choice of risk management that refers to the information on financial data. It has been noted that the most important financial ratios such as capital adequacy, coverage of provisions and the rate of return on assets have all recorded positive changes over the recent years, which illustrate that Deposit Money Bank, Nigeria has increased its capability to resist the risks of credits and to remain profitable. Such developments raise the role of financial analysis tools in lending policies and compliance with the regulations. Further, a decrease in the loan to deposit ratio indicates the more cautious tendency of lending practices caused by the development of the risk sensitivity. The good influence of financial analysis is again evidenced by credit risk assessment measures. There is a rise in the average credit scores and collateral requirements, indicating higher standards of assessment of the borrowers and depreciation of the borrower risks. A decrease in the time taken in the loan processing process also indicates that the development in the methodology of financial analysis is beneficial to the bank and the customer making use of its financial services. The quality of these financial analysis practices is determined by the quality of the lending results. Despite a reduction in the loan approval rates, this is probably due to quality-based rather than quantity-based lending decisions. The fact that loan recovery rates have increased and the interest rates decreased shows that financial analysis will lead to risk pricing and supervision of loans. Such improvement in customer satisfaction indicates that the borrowers have positively responded to such developments.

Conclusion

To sum up, the research points out that effective lending in banks is impossible without financial analysis. It helps not only in evaluating the credit risk but also enhance loan portfolio standard and financial performance. In the case of Deposit Money Bank, Nigeria, the use of financial analysis tools in the process of lending has more than helped stabilize the bank and increase its level of profitability thus placing the institution in a better position to ride out economic vagaries. On that basis, it is advised that Deposit Money Bank, Nigeria should keep investing in superior financial analysis technologies, e.g., data analytics, and credit scoring models, in order to further polish its risk assessment and decision-making. This will make the bank adapt quickly to the changes in the market environment and the borrower characteristics. Moreover, to improve the bank employees need to provide better training programs on financial analysis and credit risk management to a loan officer and a risk manager so that they can have current skills in knowledge and care. The theme of professional continuous learning will create a culture of hard work and accuracy in the loan processes.

Recommendations

1. The Deposit Money Bank is advised to have a balanced portfolio of loans that covers the SMEs and retail accounts and the issue of exposures to risky accounts. To maintain the growth and financial inclusion goals, the spread of credit risk due to proper financial analysis will be useful.
2. The bank ought to have adequate tracking mechanisms that ensure the analysis of loan performance and financial status of borrowers after lending. This is an active strategy which will enable early identification of possible defaults, which will be intervened once in order to reduce credit losses.

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3. The quality of bank lending will be improved by means of strengthening the financial analysis practices, increasing the quality of assets, and raising the financial performance.

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Qualitative Study on Teachers' Anxiety and Burnout: A Panacea for Qualitative STEM Education Objectives in Nigeria

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Abstract

Nigeria is one of the developing nations with milestone developments in science and technology over decades. From independence in 1960, there have been massive investments in education by the Federal Government as to meet up the set national educational goals to derive for the national developments. All areas of learning or disciplines were accorded utmost priorities with appropriate curricula, in particular, science and technology were the most concern of the Federal Government of Nigeria. Science, Technology, Engineering and Mathematics (STEM) education is the focus of several countries of the world of today. Significantly, the 21st century skills are highly required to drive the STEM education towards the scientific and technological advancements commensurate to the dynamic contemporary world. The paper reviewed the extent to which teachers' characteristics, specifically, anxiety and burnout serve as shields to the attainment of the STEM education objectives in Nigeria. It buttressed further the implications of the two constructs in relation to the teaching of STEM across the learning institutions and projected how, if not controlled, could go a long way in undermining and crippling the attainment of the stated STEM objectives. The authors finally recommended among others that the stakeholders in STEM education should moderate the teaching workload among science teachers in high schools and provide more incentives to them as to ensure effective teaching and learning of STEM, which invariably could lead to the smooth transition towards the attainment of STEM education objectives in Nigeria, and the world in general.

Keywords: STEM, teachers' anxiety, burnout, STEM objectives.

Introduction

For the past few decades, scientific and technical advancements have been visible from ancient to modern societies. This is unquestionably due to significant national investments in education that make use of both human and environmental resources. As a result, nations assumed the position of industrialized nations such as America, China, France, Japan, and others; to developing nations such as Nigeria, Ghana, and their allies. Education—more especially, disciplines with a focus on science and technology—is the driving factor behind this progress. In recent years, Science, Technology, Engineering, and Mathematics (STEM) education has become increasingly prevalent in modern countries because it equips students with the fundamental abilities necessary to meet the problems of the contemporary world. People with expertise in STEM fields are now essential in societies that are becoming more and more reliant on technology. The goal of STEM education is to enrich students with the knowledge and skills required to be functional and relevant in industrialization of nations. STEM education is essential in preparing the next generation of workers by encouraging critical thinking, creativity, and problem-solving. It incorporates ideas from science, technology, engineering, and mathematics into a multidisciplinary approach to education (Vega and O'Donnel, 2025). STEM places a strong emphasis on real-world problem-solving,

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practical applications, and practical experiences. Students are encouraged to think critically and creatively in STEM programs, which frequently entail group projects.

Objectives of Stem Education in Nigeria

Nigeria as a nation has dived into the pool of STEM education to enhance science and technology advancements to attain its national development. The objectives of STEM education in Nigeria include:

1. Development of a skilled workforce for the future: One of the key objectives of STEM education in Nigeria is to develop a skilled workforce that is equipped with the necessary knowledge and skills that fit the technology-driven world. This aims to prepare learners for careers in STEM-related disciplines, which are in high demand globally. Nigeria can address the skills gap and ensure that its workforce remains competitive in the global economy (Federal Ministry of Education, Nigeria (FRN, 2014).
2. Promotion of innovation and entrepreneurship: -STEM education in Nigeria also aims to foster a culture of innovation and entrepreneurship. By providing students with a strong foundation in science, technology, engineering, and mathematics, they are encouraged to think creatively, solve problems, and develop innovative solutions. This objective seeks to empower students to become future innovators, inventors, and entrepreneurs who can contribute to the socio-economic development of Nigeria (National Universities Commission (NUC), 2017)
3. Bridge the gender gap in STEM fields: - Another objective of STEM education in Nigeria is to bridge the gender gap in STEM fields. Historically, there has been a significant underrepresentation of women in science, technology, engineering, and mathematics. By encouraging girls and women to pursue STEM education and careers, Nigeria can ensure equal opportunities for all and tap into the untapped potential of women in STEM fields (United Nations Educational, Scientific and Cultural Organization (UNESCO), 2017)
4. Enhancing Problem-Solving and Critical Thinking Skills: - STEM education in Nigeria aims to enhance students' problem-solving and critical thinking skills. By engaging students in hands-on activities, experiments, and real-life applications of STEM concepts, they develop the ability to think critically, analyze information, and solve complex problems. These skills are essential for success in various fields and contribute to the overall cognitive development of students (Oludipe, 2015)
5. Foster National Development and Technological Advancement. - The fifth objective of STEM education in Nigeria aims to foster national development and technological advancements experienced in developed nations of the world. By equipping students with STEM knowledge and skills, Nigeria can definitely attain innovation, sustainable development, and technological advancements. This is in line with Nigeria's vision to become a globally competitive nation and leverage science and technology for economic growth and social progress. (National Information Technology Development Agency (NITDA), 2016)

How Teachers' Anxiety Affects STEM Education

Anxiety is a construct that has been extensively studied by researchers for a long period of time, especially in psychology and educational researches which simply refers to the feeling of uncertainty, fear, nervous in doing or about something. Teachers' anxiety is reconceptualized as future-oriented emotional syndrome caused by cognitive appraisals of threat to effective achievement of classroom goals, resulting to low self-efficacy and behavioural abnormalities (Gupta and Lee, 2025). Anxiety in teachers is a considerable affective state that may have some adverse effects on the learning and teaching processes. Similarly, it creates an unpleasant work environment and career situations; thus, teaching may be an activity that is avoided. Novice teachers, for example, find themselves in situations of bewilderment where they become unsure of how to deal with them. In addition, teachers often start their teaching career with high self-esteem and expect high outcomes. However, along the line, they tend to realize the mismatch between their ideals and the real teaching environment. At that point, most teachers feel confused and become stressed out, yet they rarely get the necessary help. This is because teaching was always thought to be a low-stressing job. According to some academic and governmental research, it indicates that teaching is among the most emotionally challenging jobs (Jones-Rincon and Howard, 2019; Stewart, 2018). It is possible that a many teacher in Nigeria experience symptoms of anxiety. This is because, poor working conditions in schools necessitate a high level of physical, intellectual, and emotional health for the teachers. However, there are a variety of emotional and psychological challenges that could have differential effects among teachers, negatively impacting their ability to teach effectively (Asaloei *et al*., 2020). Science teachers have recently experienced professional anxiety as a result of transitioning through an era of rapid worldwide change, particularly large changes in curriculum

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design and dynamic multitasking responsibilities, culminating in the formation of high-performance expectations in schools. Teacher-student conflict, teacher-family conflict, student discipline issues, insufficient assistance, lack of promotion and under-representation in decision-making are all among factors contributing to anxiety among teachers (Demir, 2018). Teachers suffer from tension, worry, job discontent, a desire to leave, as well as cognitive and emotional pain as a result of these issues (Demir, 2018). Consequently, the teachers who are not well supported and unable to socialize during their induction phase often face problems not limited to teacher's low efficacy, inconfidence, teaching reluctance, reality shock and job stress. Empirically, Carey *et al.* (2019) maintained that teachers' anxiety is a cause of a deficit in science teachers' ability and poor science students' academic achievement. The debilitating anxiety model also suggests that anxiety hinders teaching, learning, and performance as it causes stress and makes thinking difficult. It is pertinent to note that teaching anxiety is a significant affective state that may have profound effects on both the learning and teaching processes. However, if teaching anxiety in teachers is left unattended to on time, the adverse effect could extend to undermining the adequate teaching of entrepreneurship skills which is one of the objectives of STEM education across the globe. The pattern through which teaching anxiety affects the various aspects of learning, teaching processes and outcomes need to be contextualized with the objectives of STEM. This is because, students taught by anxious teachers could be deficient of basic foundation in STEM, stemming to having a deficiency in creativity and problem-solving approaches capable of contributing to the socio-economic development of Nigeria (N. U. C., 2017)

How Teachers' Burnout Affects the Achievement of STEM Education Objectives

Another significant variable of this write-up is the teacher's burnout. Teacher burnout has often been linked to years of overwork, which causes veteran teachers to feel exhausted and emotionally stressed as a result the crave for attaining STEM goals and objectives in schools (Vega and O'Donnel, 2025). However, novice teachers are also prone to burnout, which means that burnout is not only restricted to veteran teachers, but it can also develop in the first years of employment. Beginning teachers more often have feelings of anxiety due to the fact that they are inexperienced in their fields (Chang, 2019). For example, if they constantly fail in classroom management and in coping with students' disruptive behaviors, burnout may occur. Studies abound on the major triggers of teachers' burnout in learning institutions. For example, Skaalvik and Skaalvik (2019) explained factors responsible for burnout among teachers to include lack of fairness, organizations' values, role conflict and role ambiguity, lack of social support, lack of support from supervisors, lack of feedback and praise, little participation in decision making, and lack of teacher autonomy. Other factors are, but not limited to, pressure, fear of violence, poor opportunities for promotion, and unreasonable salary (Stewart, 2018). From another study, holding a position for a long time, excessive paperwork, large schools with overcrowded classrooms, the lack of equipment, students' behavioral problems, isolation, and poor social relations (Herman *et al*., 2018). Teachers are usually high achievers who like to work hard and are always looking for ways to improve.

It's important to recognize that burnout is a complex issue influenced by numerous factors, including workload, lack of resources, administrative support, and work-life balance. Addressing burnout requires creating supportive work environments, promoting mental health awareness, offering resources for stress management, and fostering a culture where seeking help is encouraged for everyone, regardless of gender. In a study by Maslach (2018), it was revealed that burnout negatively affects teachers' self-confidence, motivation, self-esteem, and productivity levels. In another dimension, Madigan and Curran (2021) unveiled that teachers' burnout also affects students' academic performance, in another words, low academic achievement and motivation observed in students are linked to teachers' burnout. This appears to be the case of learning biology, and even more so for teaching biology with a time limit. From the research conducted by Hurley (2021) on teacher's burnout as a syndrome that is produced by the mismatch of unrelenting pressure, demands, and stress among teachers and the resources needed to cope with them, indicated that teaching is among the most stressful professions. In his report, over 90% of teachers have reported experiencing job-related stress, while an estimated 46% reported high stress on daily basis. From this review, it is apparent that burnout negatively affects teachers' self-confidence, motivation, self-esteem, and productivity. By implication, teachers with burnout might not be able to enhance students' acquisition of 21st century skills as advocated in STEM education to fit the technology-driven world. This is because students acquire the necessary knowledge of all aspects through the teacher, who serves as a medium of instruction. As a source of information to students, teachers must be free of all distractions and problems capable of deterring effective classroom instruction,

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which consequently could undermine the achievement of STEM education goals and objectives, not only in Nigeria, but in all nations of the world.

Conclusion

Based on the illuminated facts from the review in this paper, the authors therefore, concluded that teachers' anxiety and burnout have a negative influence on STEM education. Thus, if teachers are subjected to anxiety and burnout as a result of excessive workload, poor incentives, and a teaching learning environment and other factors so far highlighted, effective teaching of STEM cannot be ascertained. Consequently, the attainment of STEM education objectives could remain a mirage rather than a reality in Nigeria and other societies with the same characteristics across the globe.

Recommendations

From the review in this paper, the authors made the following recommendations:

1. Stakeholders in STEM education should collaborate with curriculum designers to address teachers' burnout through creating supportive work environments, promoting mental health awareness, offering resources for stress management, and fostering a culture where seeking help is encouraged for everyone.
2. Teachers should be assigned duties appropriately to avoid overworking or overburdening, causing burnout in some of them, in schools, to enhance their productivity
3. There should be adequate motives and incentives for teachers in schools to make them happy and improve their efficiency in the achievement of STEM education objectives
4. There should be counseling services for teachers in schools to control and prevent anxieties that have adverse effects on them and the education system

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Assessment of Instructional Materials in English Language Teaching among Secondary Schools in Ede Educational Zone Area of Osun State, Nigeria

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Abstract
This study investigated the Assessment of instructional materials in English Language teaching and learning activities among secondary schools in Ede Educational Zone Area of Osun State, Nigeria. The research sought to determine the perceived importance of these materials among educators and identify the best practices for their pedagogical integration. Employing a descriptive survey research design, the study utilized a purposively selected sample of 20 English Language teachers. Data were collected using a self-designed questionnaire titled "The Impact of Instructional Material on Teaching of English Language in Secondary Schools." The findings revealed a unanimous consensus (100%) that instructional materials are vital for improving students' comprehension and long-term retention. Results further indicated that 90% of the respondents believe these tools simplify complex linguistic concepts and significantly enhance classroom interactivity. Regarding instructional delivery, 90% of teachers emphasized the necessity of explaining the relevance of materials prior to use, while 85% advocated for follow-up assessments to evaluate the effectiveness of the tools employed. The study concludes that while instructional materials are indispensable for effective language instruction, their success is largely dependent on systematic planning, regular usage, and alignment with lesson objectives. Based on these findings, the study recommends that school administrators prioritize the provision of diverse instructional resources and organize periodic training to update teachers on modern integration techniques.
Key words: Instructional Materials, Teaching, Learning, Students & Teachers

Introduction
In English language, we learn that man hardly lives alone all by himself. Through the learning of English language, we are expected to become sufficiently informed to tackle the problems and issues of words in our society. English language is a core subject at the primary and junior secondary school levels. English language like other school subjects, has its own stated objectives. These objectives specify the kinds of knowledge, skills, values and attitudes that could accrue to the learners through learning the subject. The main purpose of teaching this subject (English language) in our schools is to provide our young learners with the relevant knowledge to better understanding both their physical and social environments. Through English language, we also try to develop in them those skills and competences they would need to tackle the problems and issues of those languages and thereby live as more functional languages in the society. Eyisi et al (2023) stated that English Language occupies a unique position in the Nigerian educational system. It serves as the language of instruction from primary through tertiary levels and is the official language of communication in government, business and education. The teaching of English Language encompasses various components including grammar, composition, comprehension, literature, oral English and vocabulary development. According to Ntshauba, K. T. (2024), effective English Language teaching requires a multi-sensory approach where learners are exposed to diverse linguistic experiences through various instructional materials that cater to different learning styles. English Language is a compulsory subject that must be credited by students at the Senior School Certificate Examination (SSCE) level before gaining admission into any tertiary institution in Nigeria. The importance and complexity of this subject makes it necessary that relevant instructional materials should be used to teach it to learners. Instructional materials are resources or materials employed to facilitate effective teaching-learning process. They are used to provide the richest possible teaching-learning instruction between the teachers and learners by promoting effective communication processes. According to Schramm (2021),

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instructional materials are information carrying technologies that are used for instructional purposes with the hope of delivering educational information very quickly and very widely. Yakubu, S. A. (2020) described instructional materials as information carriers designed specially to fulfill objective in a teaching-learning situation. They are also used to transmit information, ideas and concepts to learners. Instructional materials include both visual and audiovisual aids which include pictures, flashcards, posters, charts, tape recorders, radio, video, television, computers, projectors and language laboratories among others. These materials serve as supplements to the normal processes of instruction and make abstract language concepts more concrete and comprehensible to learners. The influence of instructional materials in promoting students' academic performance and enhancing teaching and learning in educational development is indisputable. The teaching of English Language in Nigerian secondary schools needs to be properly handled, considering its status as both a subject and the medium of instruction in most schools. The materials used by teachers to teach and drive home their subject points at the secondary school level of our education system is incontrovertibly a paramount important issue in practical classroom interaction and successful transfer of knowledge from the teacher to the learners. The teaching of English Language without instructional materials may certainly result in poor academic achievement. Adetunji, A. R. (2023) reported that there were inadequate resources for teaching English Language in secondary schools in Osun State. They further stated that the available ones are not usually in good condition or are outdated. There is need therefore for improvisation and creative use of available resources. Okafor, U. M. (2024) defined instructional materials as materials that enhance or facilitate effectiveness in the teaching-learning process. They are resources that can be used by the learner whether done singly or in group, usually in an informal setting to make learning meaningful, interesting and immediate. These materials ensure that communication is effective in the classroom. For all subjects that are being taught in schools, there are specific materials for each subject. In teaching of English language there are peculiar instructional materials that are mainly for teaching of English language in our schoo1."The following are the examples of instructional material which if used wisely will increase the effectiveness of classroom teaching which will further help the realization of the aims and objectives of social studies; Backboard, Maps, Globes, Charts, Diagrams, Graphs, Films, Television, Tape-recorder, Drawings and Cartoons, School Museums and Collections and so on.

Conceptual Perspectives of Instructional Materials

Instructional materials, also known as Teaching and Learning Materials (TLM), are a vital component of the teaching and learning process. When used well, they can support learning and aid a learner in concretizing a learning experience and make learning more exciting, interesting and interactive. Instructional Materials, also known as Teaching and Learning Materials are resources that a teacher may use in teaching and learning situations to help achieve desired learning objectives and to facilitate the teaching and learning process. Broadly, the term refers to a spectrum of educational materials that teachers use in the classroom to achieve specific learning objectives. These include textbooks, multimedia components and other resources. The best instructional materials are aligned with all other elements in the course, including the learning objectives, assessments, and activities. Ideally, the teaching and learning materials will be tailored to the content in which they are being used, to the learners in whose class they are being used, and the teacher. Instructional materials can be classified by type; including audio, visual and audio-visual resources. Abdullahi, N. et al (2017) conceptualizes instructional materials as resources that teachers utilize to make their lessons explicit to learners, encompassing all forms of materials, equipment and people that teachers can use to facilitate effective teaching and promote meaningful learning experiences. This broad definition acknowledges that instructional materials extend beyond physical objects to include human resources and experiential opportunities that enhance the learning process. Chukwuebuka, I. S. (2017) described instructional materials as carriers of information and messages that are directed at learners with the intention of making the teaching-learning process interesting, meaningful and effective. This definition is particularly relevant to the African educational context, where resource constraints often necessitate creative and strategic deployment of available materials. Clegg, J., and Simpson, J. (2016). Furthermore, this analysis to language learning specifically, arguing that instructional materials for teaching English language in Africa should reflect African varieties of English language and incorporate African contexts, rather than exclusively presenting British or American English varieties and Western contexts. This perspective challenges the assumption that effective English language instruction requires exclusive focus on native speaker norms, advocating instead for approaches that acknowledge and value the multilingual realities of African learners. Koko, M., and Nkpolu-Oroworuko, P. H. (2016) offers a comprehensive definition that views instructional materials as anything that can be used to stimulate

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thoughts, feelings, concerns and ideas in the learner, thereby serving as intermediaries in the instructional process. This broad conceptualization acknowledges the diverse forms that instructional materials can take and their capacity to operate at multiple levels of human consciousness, engaging not only cognitive processes but also emotional and affective dimensions of learning.

Statement of the Problem

English language like other subjects has some peculiar materials that are purposeful in attainment of the certain objectives of the lesson. And these materials are of great value and are used by the teachers. Identifying the appropriate instructional materials to be used for certain topics is a crisis, which is caused by the unavailability of these materials. Some instructional materials are not used systematically because the levels of these materials must match the capacities of the learners of different abilities. There are some criteria to follow in selection of appropriate instructional materials which some subject teachers have neglected. Lack of knowledge of how to evaluate the materials used for teaching is another problem that reduces the effective purpose of using such instructional materials. It is on this note and desire of the researcher to find possible solutions to all above mentioned problems so that the effectiveness of the instructional material in teaching of English language will have positive implication. The act of teaching is fundamentally concerned with passing ideas, skills and attitudes from the teacher to the learner. In Nigeria, experience has shown that spoken words alone in the communication of language concepts are grossly ineffective and inefficient in producing desired learning outcomes. Every year, when the results of public examinations such as WAEC and NECO are released, there has always been a high rate of failure in English Language, particularly in comprehension, essay writing, and oral English components. The reason for this could be ascribed to the fact that there are aspects of English Language teaching that pose serious problems of comprehension to students. These aspects, such as phonetics, syntax, tense usage and idiomatic expressions, cannot be taught effectively without the use of relevant instructional materials to make the learning practical and meaningful.

Research Question

1. What impact do instructional materials have on the teaching of English language?
2. What constitutes the correct usage of instructional materials in teaching English language?

Methodology

The research design employed for this study was a descriptive research type utilizing survey method. Descriptive research design connotes describing event(s) exactly as they appear without the manipulation of external researchers. The target population for this study was all the English language teachers and students in government owned schools in Osun Sate. A stratified sampling technique was employed in selecting schools in Ede Zone Area of Osun State. Specifically, 100 samples were proportionally selected in government owned secondary schools in Ede Zone Area of Osun States. The total number of English language teachers selected for this study is 20, while 80 students were selected from the schools. The instrument used for data collection in this study was a researcher-designed questionnaire with Likert response modes of Strongly Agree (S.A), Agree (A), Disagree (D) and Strongly Disagree (S.D). Items were selected based on their relevance to "Impacts of instructional material on the teaching and learning of English Language in secondary schools in Osun State". The questionnaire contained items for each of the variables. It is structured in a clear and simple language as this enables the respondents to provide relevant answers to the questionnaire based on their personal feelings. The instrument contained three major sections, section A, B and C. Section A asked information about demographic characteristics and Biodata information of the teacher's including age, gender, teaching experience and area of specialization and so on. Section B contains questions related to the impact of instructional materials on the teaching and learning of English language in the secondary schools in Osun State. The response mode for this section was the Likerts response modes of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD). Section C sought to find out if the instructional material used in the teaching and learning of English Language are available or not. The response modes for availability is to tick out the available ones from the list provided. The questionnaire was administered to the students as well as the English language teachers during the school hours. The researcher collected the questionnaire on completion the same day. The copies of the completed questionnaire were collected from the respondents immediately, coded and analyzed.

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Presentation of Results

Research question 1: What impact do instructional materials have on the teaching of English language?
Number of Respondent (Teacher): 20

	SA	A	U	D	SD
Helps to breakdown difficult English concepts for learners	10	8	-	1	1
Improve students' comprehension and retention	14	6	-	-	-
Create a more engaging and interactive English classroom	12	8	-	1	1

SA-Strongly Agree. **A**-Agree **U**-Undecided **D**-Disagree **SD**-Strongly Disagree

Teachers saw instructional materials as very important for teaching English. All 20 teachers agreed that these instructional materials improve students' understanding and help them remember what they learn better. 18 teachers (90%) said instructional materials make classrooms more interesting and interactive. The same number (90%) also said instructional materials help make difficult English concepts easier for students to understand. These results show that teachers believe instructional materials are very helpful for making learning better and keeping students engaged.

Research question 2: What constitutes the correct usage of instructional materials in teaching English language?
Number of Respondent (Teacher): 20

	SA	A	U	D	SD
Instructional materials must be used regularly and not only occasionally to enhance learning	8	8	-	2	2
Briefing of the relationship between the instructional materials and the lesson to be taught	10	8	-	1	1
Practical assessment on each student based on what was taught with the instructional materials	8	9	-	1	2

SA-Strongly Agree. **A**-Agree **U**-Undecided **D**-Disagree **SD**-Strongly Disagree

Teachers identified several important practices for using instructional materials properly. 18 teachers (90%) said it is important to explain how the instructional materials relate to the lesson before using them. 16 teachers (80%) agreed that instructional materials should be used regularly, not just occasionally. 17 teachers (85%) said teachers should assess students based on what was taught using the instructional materials to know if they were effective. This shows that teachers know instructional materials work best when they are used with proper planning and follow-up.

Discussion of Findings

The findings of this study clearly indicate that instructional materials play a significant role in the effective teaching and learning of English Language in secondary schools. The demographic data showed that the English Language teachers involved in the study were professionally qualified and experienced, with most possessing Bachelor of Education (B.Ed.) and Bachelor of Arts (B.A.) degrees, as well as over ten years of teaching experience. This suggests that the respondents were competent to provide reliable information on instructional material utilization and its impact. According to Friday Mbon et al (2019), the effectiveness of instructional delivery depends not only on teacher competence but also on the availability and appropriate use of instructional materials. With regard to the types of instructional materials used, the study revealed that teachers make use of instructional materials such as textbooks, workbooks, charts, flashcards, diagrams, videos, slides and e-learning applications. This finding aligns with the views of Ikahobomeh, O. I., and Mohammed, A. (2023), who emphasized that instructional materials make lessons more concrete and help learners understand abstract concepts. The acceptance of digital tools by teachers further supports Murphy, V. A. (2014). assertion that effective English Language teaching requires a multi-sensory approach that caters to different learning styles. The findings on sources of instructional materials revealed that schools and online platforms are the major sources through which teachers obtain instructional materials, while government agencies play a moderate role and non-governmental organizations contribute minimally. This supports earlier findings by Akinsolu, A. O. (2017), who reported inadequate and poorly maintained instructional resources in secondary schools in Osun State. Furthermore, the study found that instructional materials have a strong positive impact on the teaching of English Language. Teachers overwhelmingly agreed that instructional materials help break down difficult English concepts, improve students' comprehension and retention, and create a more engaging and interactive classroom environment. This finding is consistent with Amos, P. (2019), who noted that instructional materials arouse learners' interest, promote participation and improve understanding. It also supports Bruner's (1966)

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theory, which emphasizes that learning is more effective when verbal instruction is combined with visual and practical experiences. The study also revealed that the effectiveness of instructional materials depends largely on their correct usage. Teachers agreed that instructional materials should be used regularly, properly explained and linked directly to lesson objectives, with follow-up assessment to evaluate students' understanding. This finding corroborates the views of Mupa, P., and Chinooneka, T. I. (2015), who stressed that even the best instructional materials are ineffective if not properly applied by the teacher. Therefore, the study confirms that instructional materials are not merely teaching aids but essential tools whose impact depends on thoughtful planning and effective utilization.

Recommendations

Based on the findings of this study, the following recommendations are made to enhance the quality of English Language instruction:

1. **Increased Government and NGO Involvement:** The Ministry of Education and relevant government agencies should move beyond a "moderate" role by providing consistent funding and modern instructional kits to secondary schools. Similarly, NGOs should be encouraged to partner with schools to bridge the resource gap.
2. **Establishment of Digital Resource Centers:** Given the heavy reliance on online platforms, schools should be equipped with functional e-libraries and high-speed internet access. This will facilitate easier access to e-learning applications and multimedia slides for both teachers and students.
3. **Continuous Professional Development (CPD):** Workshops and seminars should be organized specifically focusing on the *pedagogical application* of instructional materials. Training should move beyond "how to use" a tool to "how to align" it with specific curriculum objectives and student assessment.
4. **Encouragement of Locally Improvised Materials:** To mitigate the inadequacy of imported or expensive resources, English teachers should be trained in the "Instructional Improvisation" technique creating low-cost, high-impact visual aids from locally available materials.
5. **Standardization of Material Usage in Lesson Planning:** School administrators should ensure that lesson observations and vetting processes prioritize the integration of instructional materials. It should be mandatory for lesson notes to clearly state how specific materials will be used to break down abstract English concepts.

Conclusion

The study concludes that instructional materials are indispensable tools in the teaching and learning of English Language in secondary schools. While the presence of highly qualified and experienced teachers provides a strong foundation for academic excellence, their effectiveness is significantly amplified when supported by diverse instructional resources. The findings highlight a positive transition from traditional tools like textbooks and charts toward digital and e-learning applications, reflecting a modern, multi-sensory approach to language acquisition. However, a critical gap exists in the external support system; while schools and online platforms are primary sources of materials, government and non-governmental contributions remain insufficient. Furthermore, the study underscores that the mere presence of these materials does not guarantee success. Their impact is fundamentally tied to the teacher's ability to integrate them purposefully into lesson objectives and maintain a regular, interactive flow. Ultimately, for English Language instruction to be truly effective and engaging, there must be a synergy between teacher competence, resource availability, and pedagogical precision.

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Assessment on Level of Awareness and Preventive Measures of Type 2 Diabetes among Adults in Taraba State, Nigeria

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Abstract
This study assessed the awareness of preventive measures of type 2 diabetes among adults in Taraba State. One research question was raised and also one hypothesis was tested. Descriptive design of survey type was used for this study. The population of this study comprised all adults in Taraba State Nigeria, with the estimated population of 297,884. Slovin's formula was used to determine the sample of 399 adults for the study. The researchers used a multistage sampling procedure to select the sample for the study. The instrument for data collection in this study was researchers' developed questionnaire. The instrument consists of one section which contained ten items. Out of 399 copies of questionnaire administered to the respondents, 363 copies of questionnaire were duly completed and returned and were used for analysis. Chi-square used to test the hypotheses at 0.05 level of significance. The finding of this study indicated that adults in Taraba State are significantly aware of the preventive measures of type 2 diabetes ($\chi 2 = 61.159$; $df = 1$; $P < 0.05$). It was recommended that it was recommended despite the high-level awareness of preventive measures of type 2 diabetes among adult in Taraba State, they should intensify their efforts towards the prevention of type 2 diabetes in order to reduce the burden of the diseases to close gap between those that are aware and those who are not aware by attending health talk organized by experts.

Keywords: Awareness, Preventive Measures, Type 2 Diabetes Adults

Introduction
Diabetes mellitus is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces (WHO, 2023). Insulin is a hormone that regulates blood glucose. In 2022, 14% of adults aged 18 years and older were living with diabetes, an increase from 7% in 1990. More than half (59%) of adults aged 30 years and over living with diabetes were not taking medication for their diabetes in 2022. In 2021, diabetes was the direct cause of 1.6 million deaths and 47% of all deaths due to diabetes occurred before the age of 70 years. Another 530 000 kidney disease deaths were caused by diabetes, and high blood glucose causes around 11% of cardiovascular deaths (American Diabetes Association, 2018). Type 2 diabetes mellitus (type 2 DM) accounts for the vast majority (90%-95%) of persons living with diabetes (ADA, 2018). Diabetes mellitus is associated with acute and chronic (vascular) complications which reduce quality of life, result in disability and lead to premature mortality. Diabetes and its complications can result in considerable financial costs to people with diabetes and their families through direct medical costs, loss of work and wages with a significant toll on economic productivity (WHO, 2016). The overall population of people with diabetes has been predicted to get as high as 570 million by 2040 (Saeedi et al., 2019). According to Mayer-Davis et al., (2018), Type 2 diabetes is resulted from a combination of resistance to insulin action, as well as an inadequate compensatory insulin secretory response for the degree of insulin resistance. Mayer-Davis et al., (2018) added that Type 2 diabetes is now recognized as a major chronic public health problem throughout the world and affecting a large number of people in a wide range of ethnic and economic levels in both developed and developing countries. However, it is estimated that the developing countries will bear the brunt of this epidemic in the 21st century, with 80% of all new cases of diabetes expected to appear in the developing countries by 2025 including Nigeria. In Nigeria, similar findings have been reported where high diabetes risk was reported among adolescents in Port Harcourt (17%) (Jaja et al., 2015), Ibadan (4%) (Arigbede et al., 2017) and Osogbo (9%) (Akintayo-Usman et al., 2021). Nigeria is one of the countries in sub-Saharan Africa (SSA) that are currently groaning under a rising prevalence of diabetes mellitus (DM). A recent meta-analysis reported that approximately 5.8% (about 6 million) of adult Nigerians are living with DM (Uloko et al., 2018). This figure has been

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likened to a tip of an iceberg as it is estimated that two-thirds of diabetes cases in Nigeria are yet undiagnosed (International Diabetes Federation, 2017). More than 95% of people with diabetes have type 2 diabetes. Type 2 diabetes was formerly called non-insulin dependent, or adult onset. Until recently, this type of diabetes was seen only in adults but it is now also occurring increasingly frequently in children. Type 2 diabetes affects how the body uses sugar (glucose) for energy. It stops the body from using insulin properly, which can lead to high levels of blood sugar if not treated. Over time, type 2 diabetes can cause serious damage to the body, especially nerves and blood vessels. Type 2 diabetes is often preventable. Factors that contribute to developing type 2 diabetes include being overweight, not getting enough exercise, and genetics (Odenigbo & Inya-Osuu, 2022). Thus, considerable efforts are needed to inform adults people about diabetes to judge their risk including the severity and probability of ill effects, about the risk factors that modify their susceptibility, as well as the ease or difficulty of avoiding harm (Ardena, Paz-Pacheco, Jimeno, Lantion-Ang, Paterno, & Juban, 2020). Ibrahim and Benjamin (2023) identified high prevalence of diabetes mellitus as 16.1% (66) among patients on highly active antiretroviral therapy in Taraba State, Nigeria. Alcohol consumption, lack of physical exercise, tobacco use, family history, body mass index and hypertension are found to be contributing factors for diabetes mellitus among people. According to Adibe, Aguwa, Ukwe, Okonta, Udeogaranya, (2019), acquiring knowledge on the level of awareness among adult population about diabetes is the first step in formulating a prevention program for diabetes. Such data are extremely important to plan public-health polices with specific reference to implementation of national diabetes control programs. Additionally, there are great variations in the level of this awareness from adult population to adult population, and this needs to be explored in different ethnic and social groups for designing appropriate preventive strategies. Ng, Chan, Lian, Chuah, Waseem, and Kadirvelu (2022) stated that early diagnosis is important to prevent the worst effects of type 2 diabetes. The best way to detect diabetes early is to get regular check-ups and blood tests with a healthcare provider. The prevention of diabetes is important because it is costly both in human and monetary matters. Awareness of risk factors is a prerequisite to prevent diabetes among general population and also in high-risk groups, such as Impaired Fasting Glucose (IFG) and Impaired Glucose Tolerance (IGT). If adult people are aware of the risk factors that develop diabetes, the rate of its occurrence can be minimized**.** Evidence eventually reported that adult people who perceive themselves to be at risk of a disease are more likely to engage in and comply with efforts to prevent their risk of developing diabetes (Abdo, & Mohamed, 2021). Global Burden of Disease Collaborative Network (2021) revealed that lifestyle changes are the best way to prevent or delay the onset of type 2 diabetes. However, adult people can help to prevent themselves from type 2 diabetes and its complications by, reaching and keeping a health body weight, stay physically active with at least 150 minutes of moderate exercise each week, eat a healthy diet and avoid sugar and saturated fat not smoke tobacco. It is against this background that, the study investigated the awareness of preventive measures of diabetes among adults in Taraba State, Nigeria.

Statement of the Problem

The global and national health mandate for non-communicable diseases emphasizes that Type 2 Diabetes Mellitus (T2DM) is largely preventable through lifestyle modifications, including healthy nutrition, regular physical exercise, and weight management. Ideally, adults in Taraba State should possess a high level of awareness regarding the preventive measures of type 2 diabetes. As noted by Abiodun, Olaogun, and Akinpelu (2024), adequate knowledge and self-care practices are fundamental to delaying the onset of Type 2 diabetes and preventing its chronic complications. The Federal Government of Nigeria, primarily through the Federal Ministry of Health (FMoH), is implementing several strategies to create awareness and manage the rising burden of Type 2 diabetes among adults, with a strong focus on early detection, lifestyle modification, and community engagement. The federal government also, has a collaborative initiatives and partners with the World Health Organization (WHO), the Diabetes Association of Nigeria (DAN), and private sector stakeholders to launch initiatives like the "Stop Diabetes Initiative" and "iCARE" (increasing access to diabetes care. More so, both federal and State Government, Center for Family with Health Initiative, through community and School Outreach Programs, used to create awareness and educate adults on the risk factors of type 2 diabetes. Despite the availability of preventive strategies, the prevalence of type 2 diabetes in Nigeria is on a steep upward trajectory, with current estimates suggesting that over 5.7% of the adult population is affected (Uloko et al., 2018). In Taraba State specifically, time-series modeling of hospital data from the Federal Medical Centre, Jalingo, has revealed a slightly increasing pattern of a long-term trend in diabetes infections (Usman, 2021). The researchers as health workers with more than 10 years experiences observed that many adults are suffering with Type 2 diabetes, and this may be as a result of factors such as low educational attainment and limited access to structured health education programs which is connected with the awareness on the preventive measures

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of type 2 diabetes. Hence, this study assessed the awareness of preventive measures of type 2 diabetes among adult in Taraba State. The following research questions were raised to guide this study:

Objective of the study

Do adults in Taraba State aware of the preventive measures of type 2 diabetes

Research Question

Do adults in Taraba State aware of the preventive measures of type 2 diabetes?

Hypothesis

Ho_1: Adults in Taraba State are not significantly aware of preventive measures of type 2 diabetes.

Methodology

A descriptive design of survey type was used for this study. Marilyn (2018) explained that descriptive survey attempts to establish the range and distribution of some social characteristics, such as education or training, occupation, and location, and to discover how these characteristics may be related to certain behaviour patterns or attitudes. This design is suitable for the present study because it attempts to establish to find the level of awareness of preventive measures of diabetes among adults in Taraba State, Nigeria.The population of this study comprised of all adults in Taraba State Nigeria, with the estimated population of two hundred and ninety seven thousand, eight hundred and eighty eight (297,884) (Projected population for Taraba State, 2022). Slovin's formula was used to determine the sample of 399 adults and were used as the sample for the study. The researchers used a multistage sampling procedure to select the sample for the study. According to Madow and Madow (2016), multi-stage is one in which sampling is done sequentially across two or more hierarchical levels. Njodi and Bwala (2004), stated that multistage sampling is a procedure carried out in phases and usually involving more than one sampling method. They further stated that in a very large and diverse study population, sampling may be done in two or more stages. The instrument for data collection in this study was researchers developed questionnaire. The instrument was titled as questionnaire on awareness of preventive measures of type 2 diabetes among adult (QAPMTDA), and consist of two (2) sections A & B. Section "A" contained information on the demographic characteristics of the respondents (Senatorial zone and LGA). Section "B" contained ten (10) items on the awareness of preventive measures of type 2 diabetes among adults. The questionnaire was prepared on four (4) points Likert scale and the rating score was as follows: Strongly Agreed (SA) 4 points, Agreed (A) 3 points, Disagreed (D) 2 points and Strongly Disagreed (SD) 1 point. For the purpose of analysis, 2.5 was the middle point, therefore, any respondents that score above 2.5 points was regarded as agreeing while below 2.5 was regarded as disagreeing with the items in question. The researchers used three (3) trained health educators, who served as research assistants, the research assistants helped in administering and retrieving the questionnaire at the spot. The research assistants also helped in interpreting the contents of the questionnaire to the respondents when the need arises, in a way that did not influence the opinion of the respondents. The administration and retrieval of the questionnaire was done within two weeks. Chi-square statistics was used to test the hypotheses at 0.05 level of significance.

Presentation of Results

Out of three hundred and ninety-nine (399) copies of questionnaire administered to the respondents, three hundred and sixty-three (363) copies of questionnaire were duly completed and returned and were used for analysis and presented on the table below:

Table 1: Chi-square ($\chi 2$) summary on the awareness of preventive measures of type 2 diabetes:

Variables	Observed Frequency	Expected Frequency	Total	$\chi 2$	df	P-value
Aware	256 (70.5%)	181.5				
			363	61.159	1	.001
Not aware	107 (29.5%)	181.5				

($\chi 2 = 61.159$; df =1; $P < 0.05$)

Table above shows that 256 (70.5%) of the respondents are aware of the preventive measures of type 2 diabetes and 107 (29.5%) of them are not aware. This indicated that majority of the adult in Taraba State are aware of the preventive measures of type 2 diabetes. Chi-square ($\chi 2$) statistical test was used to compute data collected and the result value found is 61.159 at df 1 and the P-value is .001, which is less than 0.05 level of significant. The null hypotheses which stated that adults in

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Taraba State are not significantly aware of preventive measures of type 2 diabetes is hereby rejected. This means that adults in Taraba State are significantly aware of the preventive measures of type 2 diabetes.

Discussion of Findings

This study assessed the awareness of preventive measures of type 2 diabetes among adults in Taraba State, Nigeria. The outcomes of this study indicated that adults in Taraba State are significantly aware of preventive measures of type 2 diabetes. The finding lends credence with the finding of Omobuwa, and Alebiosu (2014) who conducted a study on the awareness of diabetes amongst undergraduates in a Nigerian University, South West Nigeria. The finding showed high awareness level of diabetes Meletus among participants. The finding also supported that of Maiyaki, Odjimogho, Okandeji-Barry, Agofure, and Enoch, (2021) who conducted a study on the Knowledge, Attitude, and Practices Associated with Type 2 Diabetes Mellitus among Patients Attending a Tertiary Health Facility in North-East Nigeria. The finding indicated that most of the respondents demonstrated good knowledge of the preventive measures of diabetes Meletus. Shirin, Saleh, Ferdous, Rabiul-Haque and Liaquat (2014) carried out a study on the Awareness regarding risk factors of type 2 diabetes among individuals attending a tertiary-care hospital in Bangladesh: a cross-sectional study. The finding revealed that respondents have average awareness regarding risk factors and prevention strategies of diabetes Meletus. The finding of this study is contrary to the finding of Se-kowski, Grudzia, Z-Se-kowska, Pinkas, and Jankowski (2022) who investigated the public knowledge and awareness of diabetes mellitus, its risk factors, complications, and prevention methods among adults in Poland-A. the finding demonstrated insufficient public awareness of diabetes among adults in Poland.

Conclusion

Based on this finding, it was concluded that adults in Taraba State are aware of preventive measures of type 2 diabetes.

Recommendation

Despite the high-level awareness of preventive measures of type 2 diabetes among adult in Taraba State, they should intensify their efforts towards the prevention of type 2 diabetes in order to reduce the burden of the diseases to close gap between those that are aware and those who are not aware by attending health talk organized by experts.

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Impact of Insecurity on Psycho-Social Wellbeing of Undergraduate Students in Federal University Gusau, Zamfara State, Nigeria

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Abstract

Insecurity has emerged as a persistent challenge to the effective functioning of higher education institutions in many parts of Nigeria, with implications that extend beyond physical safety to students' psychological and social wellbeing. This study examined the Impact of Insecurity on Psycho-Social wellbeing of undergraduate students in Federal University Gusau, Zamfara State, Nigeria. A descriptive survey research design was adopted, and data were collected from 364 undergraduate students selected through proportionate stratified sampling. A structured questionnaire was used to elicit students' perceptions of the psychological and social effects of insecurity, as well as the coping strategies employed in response to these challenges. Data were analyzed using descriptive statistical techniques. The findings revealed that insecurity significantly affected students' psychological wellbeing, manifesting in fear, anxiety, emotional distress, and reduced concentration, all of which undermined academic engagement and educational development. Socially, insecurity constrained students' participation in academic and extracurricular activities, limited peer interaction, and weakened their sense of belonging within the university community. The study concludes that insecurity poses a serious threat to undergraduate educational development through its psycho-social effects and highlights the need for comprehensive institutional and policy interventions.

Keywords: Insecurity; psycho-social effects; undergraduate students;

Introduction

Education remains a central instrument for individual advancement and national development, particularly in societies grappling with social and economic instability. Beyond the transmission of knowledge and skills, higher education is expected to foster critical thinking, social integration, psychological wellbeing, and civic responsibility among learners. However, these objectives presuppose the existence of a relatively secure learning environment. In contexts marked by persistent insecurity, the educational process is often disrupted, thereby undermining students' academic development and psychosocial stability. In Nigeria, insecurity has assumed diverse and increasingly complex forms, including armed banditry, kidnapping, insurgency, communal violence, and criminal activities within and around educational institutions. While much of the existing discourse has focused on the macro-level implications of insecurity for national development, comparatively less attention has been paid to its micro-level consequences on university students' psychological and social functioning. For students in higher education, exposure to insecurity-whether directly through violent incidents or indirectly through persistent fear and uncertainty-can manifest in anxiety, emotional distress, reduced social interaction, and diminished academic engagement. These psycho-social outcomes pose serious threats to students' educational development and overall wellbeing. Public universities located in Nigeria's North-West region have been particularly affected by the prevailing security challenges. Federal University Gusau, Zamfara State, for instance, has experienced incidents such as theft, burglary, kidnapping, and threats to students and staff, both on and off campus. These experiences have heightened concerns among stakeholders regarding the capacity of the university environment to support effective teaching, learning, and student development. Despite these realities, empirical studies examining how such insecurity shapes students' psycho-social experiences and educational trajectories at the university level remain limited.

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Existing studies on insecurity and education in Nigeria have largely concentrated on basic and secondary education, with emphasis on school closures, enrolment decline, and infrastructural destruction in conflict-affected areas. While these studies provide valuable insights, they often overlook the nuanced psychological and social dimensions of insecurity as experienced by undergraduate students. University students occupy a unique developmental stage marked by identity formation, social networking, and academic specialization; disruptions during this phase may have long-term implications for personal growth and professional preparedness. Against this background, this study investigates the perceived psycho-social effects of insecurity on the educational development of undergraduate students at Federal University Gusau, Zamfara State. Specifically, it examines the psychological effects of insecurity, the social consequences for students' interactions and participation, and the coping strategies adopted in response to these challenges. By foregrounding students' perceptions and lived experiences, the study contributes to a deeper understanding of how insecurity shapes educational development within Nigerian higher education institutions. The findings are expected to inform institutional policies, student support services, and broader educational interventions aimed at promoting safe and supportive learning environments in contexts affected by insecurity.

Statement of the Problem

In recent years, insecurity has become a persistent challenge confronting higher education institutions in Nigeria, particularly in the North-West region. Incidents such as banditry, kidnapping, theft, and threats to lives within and around university environments have raised serious concerns about the safety and wellbeing of students. While universities are traditionally regarded as spaces for intellectual growth, social interaction, and psychological development, the prevailing insecurity has increasingly undermined these expectations. Most existing studies on insecurity and education in Nigeria have focused largely on basic and secondary education, emphasizing school closures, enrolment decline, and infrastructural damage. However, limited empirical attention has been given to the psycho-social experiences of undergraduate students who continue to study in insecure university environments. This gap is critical because undergraduate students are at a formative stage of development where psychological stability and social engagement are essential for effective learning and personal growth. At Federal University Gusau, Zamfara State, recurring security threats have generated fear, anxiety, and social withdrawal among students. These experiences potentially interfere with concentration, academic participation, peer interaction, and overall educational development. Despite these realities, there is insufficient documented evidence on how insecurity affects students' psychological wellbeing and social experiences, as well as how these effects collectively shape their educational development. The problem, therefore, is the lack of adequate empirical understanding of the perceived psycho-social effects of insecurity on undergraduate students' educational development in Nigerian public universities, particularly within highly affected regions. Addressing this problem is necessary for informing institutional policies and interventions aimed at creating safe and supportive learning environments.

Objectives of the Study

The main objective of the study is to examine the perceived psycho-social effects of insecurity on the educational development of undergraduate students at Federal University Gusau, Zamfara State. The specific objectives are to:

1. Examine the psychological effects of insecurity on undergraduate students' educational development;
2. Assess the social effects of insecurity on undergraduate students' academic and social participation;
3. Determine how insecurity influences students' concentration, motivation, and engagement in learning activities;
4. Identify the coping strategies adopted by undergraduate students in response to insecurity within the university environment.

Research Questions

The study seeks to provide answers to the following research questions:

1. What are the psychological effects of insecurity on undergraduate students' educational development?
2. How does insecurity affect the social interactions and participation of undergraduate students within the university environment?
3. In what ways does insecurity influence students' academic concentration, motivation, and engagement?
4. What coping strategies do undergraduate students adopt to manage the psycho-social effects of insecurity?

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Insecurity and the Higher Education Environment

Insecurity constitutes a significant threat to the effective functioning of educational institutions, particularly within fragile and conflict-affected societies. In the context of higher education, insecurity extends beyond physical threats to include persistent fear, uncertainty, and perceived vulnerability within the learning environment. Scholars have conceptualized insecurity as a condition characterized by exposure to real or perceived threats that undermine individuals' sense of safety and stability (Beland, 2005). Within universities, such conditions disrupt academic routines, weaken institutional trust, and compromise students' engagement with learning processes. Studies in developing contexts indicate that insecurity negatively affects campus life through increased anxiety, restricted mobility, and limited participation in academic and extracurricular activities (Buzan, 1991; Gates, 2009). When students perceive their environment as unsafe, attention is diverted from academic pursuits toward personal survival and emotional regulation. This shift has profound implications for educational development, as sustained learning requires psychological safety and social support. In Nigeria, the proliferation of kidnapping, banditry, and violent crime has heightened security concerns within public universities, particularly in northern regions. Although universities are traditionally viewed as protected spaces, recurring incidents within and around campuses have challenged this assumption. The resulting climate of fear has implications not only for institutional stability but also for students' academic progression and psychosocial wellbeing.

Psychological Effects of Insecurity on Students

The psychological dimension of insecurity has been widely recognized as a critical factor influencing students' educational outcomes. Psychological effects commonly associated with insecurity include fear, anxiety, emotional distress, reduced concentration, and lowered self-confidence (Eysenck et al., 2007). In educational settings, these outcomes interfere with cognitive functioning, motivation, and academic persistence. Bandura's concept of self-efficacy suggests that individuals' belief in their capacity to succeed influences their academic performance and resilience (Bandura, 1986). Insecure environments weaken this belief by exposing students to continuous stressors that erode confidence and emotional stability. Empirical studies have shown that students experiencing insecurity often report difficulty concentrating during lectures, avoidance of academic spaces, and diminished academic motivation (Marsh, 1990). Furthermore, prolonged exposure to insecurity may lead to chronic stress and psychological exhaustion, which negatively affect learning capacity and mental health. In higher education, where independent learning and critical engagement are essential, such psychological strain can significantly hinder students' educational development and long-term academic achievement.

Social Effects of Insecurity on Educational Development

Beyond individual psychological experiences, insecurity also produces significant social consequences that shape students' educational trajectories. Social engagement, peer interaction, and participation in campus activities are integral to holistic educational development. In insecure environments, students may withdraw from social spaces due to fear of victimization, thereby limiting opportunities for collaborative learning and social integration. Research indicates that insecurity disrupts social cohesion within educational institutions by fostering mistrust, isolation, and reduced participation in academic communities (La Greca & Harrison, 2005). These social disruptions weaken students' sense of belonging, which has been identified as a key predictor of academic success and persistence in higher education. Also, recent discoveries, indicates educational insecurity, in Nigeria, is causing a move from well-rounded learning to focus on basic survival skills. Ogunode (2022) and Adebayo (2019) state that insecurity do not only shuts down schools but also lowers the standard of social and practical lessons for those still attending. Ogunode (2022) claim that Departmental heads and School Management are adopting a defensive mindset because of this insecurity. To try to keep students safe, schools limit going for outreaches, creating isolated environments. This cuts off the standard social aspect of learning, where students engage with their communities. Educational sociologists often talk about the "Hidden Curriculum" the unsaid lessons undergraduate learn interactively about society, trust, and civic duty, remains absent. Adebayo (2019) adds that an unsafe setting hurts a student's overall growth, not just grades. Students start to see the world negatively. Instead of seeing the community as a place to learn, they are taught to see it as dangerous. This creates a generation that avoids social situations and is suspicious of public areas. In contexts where insecurity affects movement and public gatherings, students therefore avoid group discussions, student organizations, and extracurricular activities that support personal and professional development. Such limitations reduce exposure to diverse perspectives, leadership opportunities, and peer support systems, thereby constraining educational development beyond formal classroom learning.

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Theoretical Framework

This study is anchored in Structural Functionalism Theory, which conceptualizes society as an interconnected system composed of interdependent institutions, each performing functions necessary for social stability (Durkheim; Parsons). Education and security are viewed as critical social structures whose effectiveness depends on their mutual reinforcement. When security is compromised, the educational system becomes dysfunctional, resulting in disruptions that affect individual development and societal progress. Within this framework, insecurity represents a systemic disturbance that undermines the equilibrium required for effective educational functioning. Universities, as social institutions, rely on stability and order to fulfil their roles in knowledge transmission, socialization, and human capital development. Persistent insecurity therefore destabilizes not only institutional operations but also students' psychological and social development. Structural Functionalism provides a useful lens for understanding how insecurity at the societal level translates into psycho-social challenges at the individual level, ultimately affecting educational development. The theory supports the argument that restoring security is essential for the effective functioning of higher education institutions and the holistic development of students.

Methodology

The study adopted a descriptive survey research design to examine undergraduate students' perceptions of the psycho-social effects of insecurity on their educational development. This design was considered appropriate because it enables the systematic collection of data from a defined population in order to describe prevailing conditions, attitudes, and experiences related to insecurity within the university environment. The survey approach is particularly suitable for studies that seek to capture subjective perceptions and psycho-social outcomes across a relatively large population. The study was conducted at Federal University Gusau, Zamfara State, Nigeria. The university is a public higher education institution located in Nigeria's North-West region, an area that has experienced recurrent security challenges in recent years. The population of the study comprised all undergraduate students enrolled at the university during the 2022/2023 academic session, totaling 7,988 students across four faculties: Education, Humanities, Management and Social Sciences, and Sciences. Undergraduate students were considered appropriate for the study because they are directly exposed to the academic, social, and environmental conditions influenced by insecurity within and around the campus.

Faculty	Gender	Population
Education	Male	1074
	Female	751
Humanities	Male	394
	Female	195
Magt & social sci	Male	1339
	Female	536
Science	Male	2520
	Female	1179
Total		**7988**

Source: Directorate of ICT (2023)

A sample size of 364 undergraduate students was selected for the study. The sample size was determined using the Research Advisor (2006) sample size determination table, which is commonly employed in social science research for population-based surveys. To ensure fair representation, proportionate stratified sampling technique was adopted. The population was first stratified according to faculty and gender, after which participants were selected proportionately from each stratum. This approach enhanced the representativeness of the sample and reduced sampling bias.

Faculty	Gender	Population	Sample selected
Education	Male	1074	48
	Female	751	34
Humanities	Male	394	18
	Female	195	10
Magt & social sci	Male	1339	60
	Female	536	24

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Science	Male	2520	113
	Female	1179	53
Total		**7988**	**364**

Data were collected using a structured questionnaire, titled Impact of Insecurity on Psycho-Social Wellbeing of Undergraduate Students. (IIPWUS). The instrument consisted of two sections. Section A elicited demographic information of the respondents, including faculty and gender. Section B contained items designed to measure students' perceptions of the psychological effects, social effects, and coping strategies related to insecurity. The items were structured on a Likert-type scale, allowing respondents to indicate the extent to which they agreed or disagreed with each statement. To establish content and face validity, the questionnaire was reviewed by experts in educational psychology and measurement and evaluation. Their suggestions guided revisions to ensure clarity, relevance, and appropriateness of the items. The reliability of the instrument was determined using the test–retest method, and the responses were analyzed using Cronbach's alpha coefficient. The reliability coefficient obtained indicated that the instrument was sufficiently reliable for data collection in the study. The researcher obtained permission from relevant university authorities before administering the questionnaire. The questionnaires were distributed to the selected respondents across the four faculties with the assistance of trained research aides. Participation was voluntary, and respondents were assured of confidentiality and anonymity. A high retrieval rate was achieved, as most of the distributed questionnaires were duly completed and returned. Data collected were analyzed using descriptive statistical techniques, mean scores, and standard deviations. These methods were employed to address the research questions and to summarize students' perceptions of the Impact of Insecurity on Psycho-Social Wellbeing of Undergraduate Students. The analysis was conducted using appropriate statistical procedures to ensure clarity and accuracy in data presentation. Therefore, the study adopted a descriptive survey research design. The population comprised all undergraduate students of Federal University Gusau during the 2022/2023 academic session. A sample of 364 students was selected using proportionate stratified sampling. Data were collected using a structured questionnaire, validated by experts and tested for reliability. Descriptive statistics were used for data analysis.

Presentation of Results

This chapter presents and discusses the results obtained from the analysis of data collected through the Impact of Insecurity on Psycho-Social Wellbeing of Undergraduate Students (IIPWUS). The analysis is organized according to the research questions guiding the study. Descriptive statistics, specifically mean scores and standard deviations, were used to analyze respondents' perceptions. The findings revealed that insecurity significantly affected students' psychological wellbeing, leading to fear, anxiety, and reduced academic concentration. Social participation was also constrained, as students avoided group activities and campus engagements due to security concerns. Although students adopted coping strategies such as movement restriction and peer reliance, these measures were largely adaptive and insufficient to address structural insecurity challenges, here are the discussion in details;

Table 1 What are the psychological effects of insecurity on undergraduate students' educational development?
Mean and Standard Deviation of Respondents on Psychological Effects of Insecurity

S/N	Items	Mean	S/D	Decision
1.	Insecurity makes me feel anxious during academic activities	3.21	0.78	Agree
2.	Fear arising from insecurity affects my emotional stability	3.15	0.81	Agree
3.	Insecurity negatively influences my academic confidence	3.08	0.84	Agree
Cluster mean		**3.15**	**0.81**	**Agree**

The results in Table 1 show that respondents agreed that insecurity has significant psychological effects on their educational development. All the items recorded mean scores above the criterion mean of 2.50, with a cluster mean of 3.15. This indicates that insecurity generates anxiety, emotional instability, and reduced academic confidence among undergraduate students. These findings suggest that persistent exposure to security threats creates psychological distress that interferes with students' ability to function optimally in academic settings. The result supports Eysenck et al. (2007), who assert that anxiety negatively affects cognitive processing and concentration. Within the context of Federal University Gusau, insecurity appears to undermine the emotional stability required for effective learning, thereby constraining students' educational development.

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Table 2 How does insecurity affect the social interactions and participation of undergraduate students within the university environment?

Mean and Standard Deviation of Respondents on Social Effects of Insecurity

S/N	Items	Mean	S/D	Decision
1)	Insecurity limits my participation in group academic activities	3.10	0.83	Agree
2)	Fear of insecurity discourages free interaction with peers	3.05	0.86	Agree
3)	Insecurity reduces my sense of belonging in the universities	2.98	0.88	Agree
Cluster mean		**3.04**	**0.86**	**Agree**

Table 2 reveals that insecurity adversely affects students' social interactions and participation. The mean scores for all items exceeded the benchmark mean, resulting in a cluster mean of 3.04. This implies that insecurity limits students' involvement in academic group work, restricts peer interaction, and weakens their sense of belonging within the university community. Social interaction is a crucial component of higher education, fostering collaborative learning and social integration. The findings align with La Greca and Harrison (2005), who found that perceived insecurity often leads to social withdrawal and isolation. The reduced social engagement observed in this study suggests that insecurity undermines not only academic learning but also the broader social dimensions of educational development.

Table 3 In what ways does insecurity influence students' academic concentration, motivation, and engagement?

Mean and Standard Deviation of Respondents on Academic Concentration, Motivation, and Engagement

S/N	Items	Mean	S/D	Decision
1.	Security concerns make it difficult to concentrate in lectures	3.18	0.80	Agree
2.	Insecurity reduces my motivation to attend classes	3.02	0.85	Agree
3.	My academic engagement decreases during periods of insecurity	3.12	0.82	Agree
Cluster mean		**3.11**	**0.82**	**Agree**

The results presented in Table 3 indicate that insecurity significantly disrupts students' academic concentration, motivation, and engagement. The cluster mean of 3.11 confirms that respondents generally agreed that insecurity negatively influences their academic commitment. This finding implies that when students are preoccupied with safety concerns, their attention and motivation towards learning decline. The result corroborates Marsh (1990), who emphasized that a stable learning environment is essential for sustaining academic motivation and self-concept. Insecurity therefore poses a direct threat to students' academic engagement and overall educational development.

Table 4 What coping strategies do undergraduate students adopt to manage the psycho-social effects of insecurity?

Mean and Standard Deviation of Respondents on Coping Strategies

S/N	Items	Mean	S/D	Decision
1.	I avoid certain areas or activities to cope with insecurity	3.26	0.77	Agree
2.	I rely on friends and peers for emotional support	3.09	0.84	Agree
3.	I adjust my academic routine to cope with insecurity	3.14	0.81	Agree
Cluster mean		**3.16**	**0.81**	**Agree**

Table 4.4 shows that undergraduate students adopt various coping strategies to manage the psycho-social effects of insecurity. The cluster mean of 3.16 indicates agreement that avoidance behaviors, peer support, and routine adjustments are commonly used strategies. While these coping mechanisms demonstrate students' adaptability and resilience, they are largely self-directed and reactive. Such strategies may reduce immediate exposure to risk but do not address the structural causes of insecurity. This finding aligns with stress and coping theories, which suggest that prolonged reliance on avoidance strategies may lead to emotional fatigue and reduced academic effectiveness over time.

Discussion of Findings

The findings of this study collectively demonstrate that insecurity has profound psychological, social, and academic implications for undergraduate students at Federal University Gusau. Insecurity generates fear and anxiety, restricts social

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participation, reduces academic engagement, and compels students to adopt coping strategies that are largely insufficient for long-term educational development. Interpreted within the Structural Functionalism framework, the results highlight how breakdowns in security structures disrupt the effective functioning of the educational system, thereby undermining students' psycho-social wellbeing and academic growth.

Discussion of Findings within the Theoretical Framework

This study examined the psycho-social effects of insecurity on undergraduate students' educational development at Federal University Gusau, Zamfara State, using Structural Functionalism as its guiding theoretical lens. Structural Functionalism posits that society operates as an integrated system in which institutions such as education and security perform complementary roles necessary for social stability and individual development. Within this framework, insecurity represents a systemic dysfunction that disrupts the normal functioning of educational institutions and negatively affects students' psychological and social wellbeing. The findings revealed that insecurity significantly affects students' psychological wellbeing, manifesting in heightened anxiety, emotional instability, and diminished academic confidence. From a structural functionalist perspective, these outcomes indicate a breakdown in the security structure that ordinarily provides the stability required for effective educational functioning. When security fails to perform its stabilizing role, the education system becomes strained, leading to impaired cognitive and emotional functioning among students. The persistent fear and anxiety reported by respondents suggest that students are compelled to prioritize personal safety over academic engagement, thereby weakening the educational institution's capacity to fulfil its role of intellectual and human capital development. Socially, the study found that insecurity constrains students' participation in group academic activities, limits peer interaction, and weakens their sense of belonging within the university community. Structural Functionalism emphasizes social integration and cohesion as essential for societal stability. In this context, reduced social interaction among students reflects a disruption in the socialization function of the university. Universities are not only centers for knowledge transmission but also spaces for social learning, value formation, and identity development. Insecurity-induced social withdrawal therefore undermines these latent functions of education, resulting in fragmented academic communities and weakened social bonds. The findings also demonstrated that insecurity negatively influences students' academic concentration, motivation, and engagement. Within the functionalist framework, effective learning requires a stable environment where institutional structures support individual roles. When insecurity dominates the educational environment, students' role performance as learners is compromised. The observed decline in motivation and engagement suggests that insecurity distorts the equilibrium between institutional expectations and students' capacity to meet them, ultimately affecting educational productivity. Although students adopted coping strategies such as avoidance behaviors, reliance on peer support, and adjustment of academic routines, these strategies were largely adaptive rather than transformative. From a structural functionalist standpoint, such individual-level adjustments signal attempts by actors within the system to restore balance in the face of systemic failure. However, these coping mechanisms do not address the root causes of insecurity and therefore cannot substitute for effective institutional and societal interventions. The persistence of insecurity continues to undermine the functional integration of the educational system, reinforcing the need for structural solutions rather than reliance on individual resilience alone. Overall, the findings affirm the relevance of Structural Functionalism in explaining how insecurity, as a systemic disturbance, translates into psycho-social challenges that hinder undergraduate educational development

Conclusion

This study concludes that insecurity poses a serious threat to the psycho-social wellbeing and educational development of undergraduate students at Federal University Gusau, Zamfara State. The findings demonstrate that insecurity generates psychological distress, limits social interaction, reduces academic motivation and engagement, and compels students to adopt coping strategies that are insufficient for sustained educational development. These effects collectively undermine the capacity of the university to function effectively as a social institution. Interpreted within the Structural Functionalism framework, the study highlights how the failure of security structures disrupts the equilibrium required for effective educational functioning. When insecurity persists, the education system becomes dysfunctional, affecting not only academic outcomes but also students' psychological stability and social integration. The study therefore underscores the critical importance of security as a foundational condition for effective higher education delivery and holistic student development.

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Institutional and Policy Implications

The findings of this study have important implications for higher education institutions and educational policy in Nigeria, particularly in insecurity-prone regions.

At the institutional level, university management must recognize security as an integral component of educational quality and student wellbeing. Strengthening campus security infrastructure, improving surveillance, and enhancing collaboration with external security agencies are essential steps toward restoring a stable learning environment. Additionally, universities should institutionalize functional counselling and mental health support services to address the psychological consequences of insecurity and promote students' emotional resilience.

From a policy perspective, the study highlights the need for government and educational stakeholders to prioritize security within higher education planning and funding frameworks. Policies aimed at improving access, quality, and equity in higher education must be complemented by deliberate investments in campus security and student support systems. Insecurity should be addressed not merely as a law enforcement issue but as an educational development challenge with long-term implications for human capital formation and national development.

Furthermore, policy interventions should encourage integrated approaches that link security provision with student welfare, counselling services, and community engagement. Such coordinated strategies are necessary to restore institutional stability and ensure that universities can effectively perform their academic and social functions.

Limitations and Directions for Further Research

Despite its contributions, this study has certain limitations that should be acknowledged. First, the reliance on self-reported data may introduce subjective bias, as respondents' perceptions of insecurity and its effects may be influenced by personal experiences and emotional states. Second, the study was limited to a single public university, which restricts the generalizability of the findings to other institutions and regions.

Future research should adopt mixed-method approaches that combine quantitative surveys with qualitative interviews or focus group discussions to provide deeper insights into students' lived experiences of insecurity. Comparative studies across multiple universities and geopolitical zones would also enhance understanding of regional variations in the psycho-social effects of insecurity. In addition, longitudinal studies could explore the long-term educational and psychological consequences of prolonged exposure to insecurity among undergraduate students.

Recommendations

Based on the findings of the study, the following recommendations are made:

1. Strengthening Campus Security: University management should strengthen campus security through improved surveillance systems, adequate lighting, controlled access points, and regular security patrols. Collaboration with local security agencies should be enhanced to ensure rapid response to security threats within and around the campus.
2. Provision of Counselling and Mental Health Services: Functional counselling and psychological support units should be established or strengthened within the university to address fear, anxiety, and emotional distress associated with insecurity. Professional counsellors should be made accessible to students to promote psychological wellbeing and academic resilience.
3. Student Awareness and Safety Education: The University should organize regular orientation programs, workshops, and seminars to educate students on personal safety, risk awareness, and effective coping strategies in insecure environments.
4. Improvement of Learning and Accommodation Facilities: Efforts should be made to provide safe on-campus accommodation and learning facilities to reduce students' exposure to external security risks, particularly during late academic activities.

Acknowledgement

We wish to express our sincere appreciation to all individuals and institutions whose support contributed to the successful completion of this study. First, we acknowledge the management of Federal University Gusau, Zamfara State, for providing an enabling environment and granting the necessary permission that facilitated data collection within the university community. Our gratitude also goes to the undergraduate students of the university who willingly participated in the study and provided honest responses, without which this research would not have been possible. We are particularly grateful to colleagues in the field of education and psychology who offered valuable academic insights and constructive suggestions

during the development of the research instrument and the refinement of the study. Their professional guidance greatly enhanced the quality and clarity of the work. We also acknowledge the contributions of friends and associates who provided moral encouragement and logistical support throughout the research process. Above all, we express our profound gratitude to God Almighty for the wisdom, strength, and perseverance granted to us in the course of conducting this research and bringing it to completion

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Qualitative Study on Application of Mathematical Principles in Architectural Design in Nigeria

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Abstract
This paper focused on "qualitative study on application of Mathematical principles in architectural design in Nigeria". Mathematical principles have played a vital role in architectural design such as the foundation, the columns, beams, slabs, footings, stairs and the roofing. It was recommended that Mathematic curriculum should be design to embrace practical principles to architectural designs.
Keywords: Mathematical Principles & Architectural Design

Introduction
Every building, be it a place of worship or learning, a grocery store, a mall, a sport arena or perhaps a kiosk, is a product of mathematical principles. Chances are that you are in a building even as you read this paper. Many times, we hear the phrase, "mathematics is the mother of all science and is everywhere, all around us" but how often do we try to find the connection between mathematics and design or mathematics and building design, specifically? There is no one definition of mathematics as various scholars have tried to define mathematics based on their perception of the discipline. According to Merriam Webster Dictionary, mathematics is the science of numbers and their operations, interrelations, combinations, generalizations, and abstractions and of space configurations and their structure, measurement, transformations, and generalizations. Wikipedia defines mathematics as an area of knowledge that includes the topics of numbers, formulas and related structures, shapes and the spaces in which they are contained, and quantities and their changes. This makes the practicality of mathematics even more acceptable. This is because, looking around us, we can so easily identify various shapes of different sizes, we also deal with numbers in counting as well as measurements in our day-to-day tasks and sometimes, apply basic mathematical principles in solving simple problems. Soyemi (2005) noted that everybody uses mathematics in one way or the other in solving life problems. Beyond its application in everyday activities, mathematics can and indeed has been employed to accomplish far greater feats especially in the area of design. Egbe (2016) asserted that mathematics is made up of so many branches like algebra, geometry, trigonometry, statistics, topology, mensuration, etc. These concepts and others such as patterns, symmetry, spaces, arrangement and sequence are so important in design and all stem from mathematics. Dahiru (2016) described geometry as a practical science concerned with surveying, measurement of areas and volumes. He went further to point out that among the notable accomplishments, one can find formulae for lengths, areas and volumes, which can be applied to get the circumference and area of a circle, area of a triangle, volume of a cylinder, sphere and pyramid. According to Meremikwu and Enukoha (2010), mathematics is one of the formal disciplines that helps man lay a solid foundation for future survival. Mathematics is a universal part of the human culture. It is a tool and language of commerce, engineering and other sciences including physics, computing and biology. It helps in recognizing patterns and to understand the world around us. Taking a look at architecture, the starting point in design, especially that of building designs, one can observe that before construction workers can build any structure, an architect has to design it. Since ancient times, architects have incorporated geometric, algebraic and trigonometric principles to sketch and plan the shapes and spatial forms of buildings. Other mathematical concepts such as probability are also used to predict and calculate the possibility of encountering hazards during and after construction therefore, they design competent structures that can withstand these hazards when brought to three dimensions upon completion. Euclid, the Greek mathematician in 300 B.C., defined a mathematical law of nature called the Golden Ratio, also referred to as the Golden constant. For over two thousand years, architects have used this formula to design proportions in buildings and it still serves as a basic geometric principle in architecture. The Taj Mahal, one of the wonders of the world is known for the golden ratio of its dome. Interestingly, ancient engineers and architects were also mostly mathematicians. Ancient

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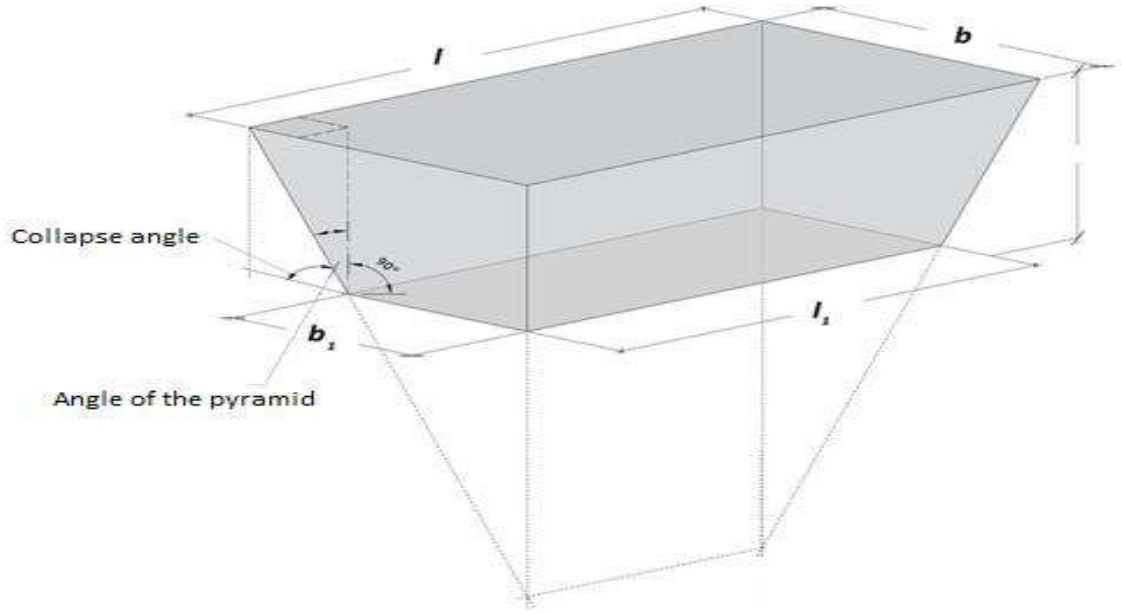
monumental structures such as the great pyramids of Ancient Egypt, magnificent temples and stadiums were built using principles like that of triangles in geometry, calculus and algebra among others. The Pythagorean theorem, formulated in the 6th century B.C., has also been used for centuries to calculate the size and shape of a structure. This theorem enables builders to accurately measure right angles. Truly, the various applications of mathematics and its principles in building design over centuries cannot be exhausted. This paper seeks to explain the interface of mathematics and design. However, the focus will be on the aspect of building design. The areas to be considered include: The building foundation, slabs, beams, columns, and footings, stairs and roofing.

Objective of The Study

i. To assess the application of Mathematical principles in architectural design in Nigeria

FOUNDATION PLAN AND MATHEMATICS PRINCIPLES

A building consists of the substructure and the superstructure. The superstructure consists of all the parts above the ground while the substructure is the part of the building that is below the ground. The foundation is a part of the substructure and the first step in building a solid house is the construction of its foundation. The foundation is in direct contact with the soil and transmits the load of the superstructure to the ground. Procedure for construction of foundation starts with deciding its depth and width, and marking layout for excavation and centerline of foundation. Before a foundation can be built, soil extraction has to be done and the total volume of the soil to be extracted must be calculated. Soils come in various forms and can be categorized based on their strength ranging from soft soil to rock formation. Whatever the soil type, the foundation must be firm and solid. Although softer soils cost more when constructing the foundation, rocky soil formation may also require processes like soil blasting or other expensive methods to break the rocks. It is necessary to note the natural collapse angle of the soil in question as it is an important indicator. For instance, on rocky soil it can be vertical at 90°, on regular sand it can vary but it can be at 30°, on quicksand it also varies because runny water takes some soil with it (Pärnumaa, 2020). In a construction drawing, the natural collapse angle is shown either in degrees or ratios.



A different formula can also be used, but its result will not be so exact:

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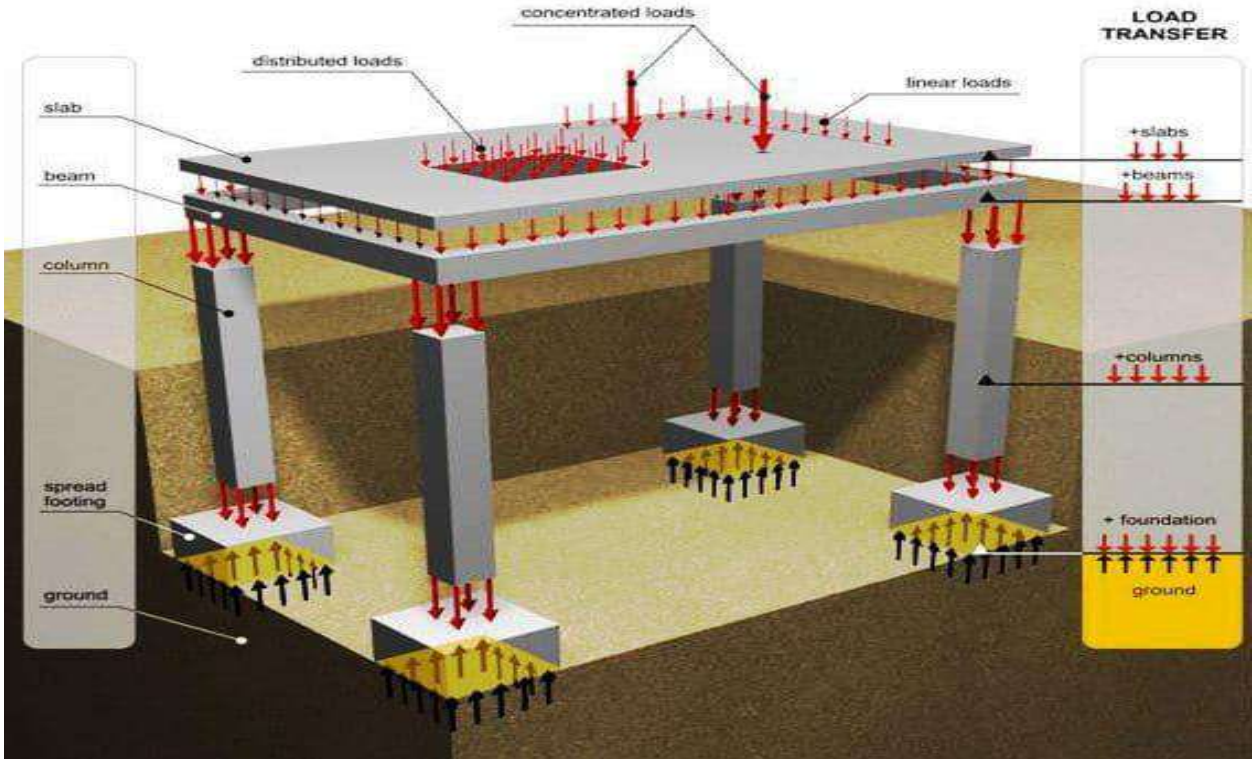
$$V \approx h \cdot \frac{l+l_1}{2} \cdot \frac{b+b_1}{2}$$

Most buildings' foundations, with the exception of fun houses have right angles at their corners. These are referred to as "perfectly square" corners. The closer they look to right angles, the more tightly fit the beams, joists and other structural supports will be. In order to ensure that all the angles are right, that is, 90 degrees, two methods can be employed, Viz: Pythagorean Theorem Method and the 3-4-5 Method which date back to ancient Greece. Although the two methods have different names, they basically mean the same thing and are based on the same theorem- the Pythagorean theorem which states that in a right-angle triangle having three sides with lengths a, b and c, the sum of the square of the shorter sides is equal to the square of the longest side. Mathematically, $a^2+b^2=c^2$. Where a and b represent the lengths of the shorter sides and c the length of the hypotenuse (the longest side). The 3-4-5 methods simply assigns real numbers as the values of a, b and c where a is 3, b is 4 and c is 5. Apparently, 5 is the highest value and therefore is the length of the hypotenuse.
Practically, applying $a^2+b^2=c^2$, we have that $3^2+4^2=5^2$. This gives us $9+16=5^2=25$. The numbers in the 3-4-5 method provides an easier way to remember the Pythagorean theorem.

APPLICATION OF MATHEMATICAL PRINCIPLES IN ARCHITECTURAL DESIGN OF FOOTINGS, COLUMNS, BEAMS AND SLABS



Slab: This is a horizontal structural element with top and bottom surfaces parallel or almost parallel to each other. is constructed to create flat surfaces such as floors, roofs, and ceilings. Usually, they are supported by beams, columns (concrete or steel), walls, or the ground. The depth of a concrete slab floor is very small compared to its span (length and width). The forces transfer from slab to beams occur either in one way or in two ways. The total system completely counts on the geometrical dimensions of the slab. Sometimes, slabs are supported by columns only, in this case two way action will prevail. If the ratio of the long side to the short side is less than two, it is referred to as 2-way slab, and if the ratio of the longer side to the shorter side is greater than two, then it is considered as 1-way slab.

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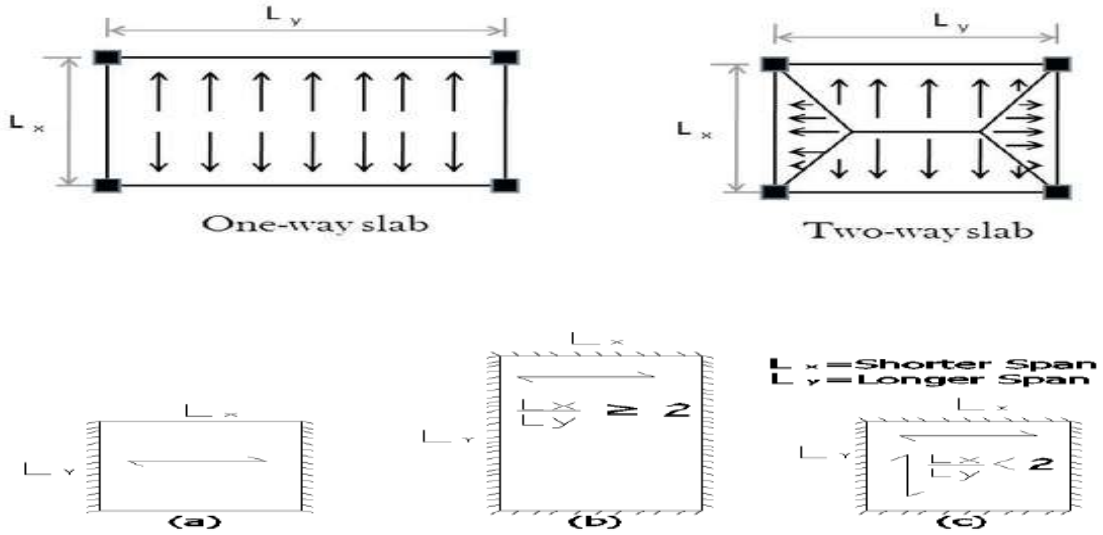
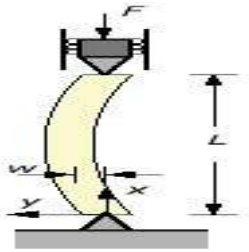


So assuming we have a slab with a thickness of 150 mm, the self- weight of Concrete is around 2400 kg/m^3 . The slab load will be= 0.150 x 1 x 2400 = 360 kg which is equivalent to 3.53 kN. *Total load on slab= dead Load + Live Load +Wind Load + Self-Weight. Dead load = volume of component x unit weight of materials.

Beams: A beam is also a horizontal structural element. It can withstand vertical loads, shear forces and bending moments. The loads applied to the beam result in reaction forces at the support points of the beam. The total effect of all the forces acting on the beam is to produce shear forces and bending moment within the beam, that in turn induce internal stresses, strains and deflections of the beam. They transfer loads imposed along their length to their end points where the loads are transferred to columns or any other supporting structural elements. Load on Beams = Self Weight per running metre

Example: Each metre of the beam has dimensions of 300 mm x 600 mm excluding slab thickness, assume each (1m) meter of the beam has dimension. Weight of concrete is around 2400 kg/m^3 , Self-weight of Concrete is around 2400 kg/m^3, which is equal to 24.54 kn/m^3 and the self-weight of Steel is around 7850 kg/m^3. (Note: 1 Kilonewton Is Equal to 101.9716 Kilograms). To calculate the beam load: 300 mm x 600 mm excluding slab.; Volume of Concrete = 0.30 x 0.60 x 1 =0.18 m^3; Weight of Concrete = 0.18 x 2400 = 432 kg; Weight of Steel (2%) in Concrete = 0.18 x 2% x 7850 = 28.26 kg; Total Weight of Column = 432 + 28.26 = 460.26 kg/m = 4.51 KN/m; So, the self-weight will be around 4.51 kN per running meter.

Columns: Column is a vertical structural component that carry loads mainly in compression. The column is a very important structure in a building because the safety of a building rests on the column strength. If the strength of the column fails, it could lead to progressive collapse in buildings. Columns transfer vertical loads from a ceiling, floor or roof slab or from a beam, to a floor or foundation. They are mainly subjected to the effective length and axial loads of which exceeds three times its least lateral dimension. They also carry bending moments about one or both of the cross-section axes. The compression component whose effective length is less than three times its least lateral dimension is called Pedestal while the component which is inclined or horizontal and is subjected to axial loads is called Strut.



Load on Column = Self Weight x Number of floors

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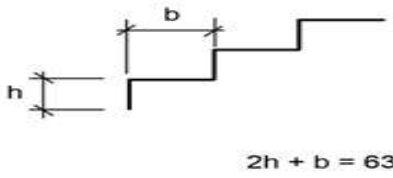
Footings: Gopal (2018), in an article, described footing as a structure constructed in brickwork, masonry, or concrete under the base of a wall or column for distributing the load over a large area. Footings are structural elements that transmit the load of the entire building structure to the underlying soil below the building. They are designed to transmit these loads to the soil which is the root support of the footing without exceeding the safe bearing capacity of the soil. All the forces that come in contact with the footings will be transferred to the soil. The bearing capacity changes from one type of soil to another and it is the key factor in estimating the size of footings.

STAIRS AND MATHEMATICS CONCEPT

Another part of construction that uses pitch (or slope) calculation are stairs. When constructing stairs, the ratio of the rise to the tread should be taken into consideration so that a proper staircase that can be comfortably used by people will be created. To calculate the height of the stairs a simple formula is used. This formula helps to find the optimal ratio between the rise and tread of the step. **2h+b=630 mm** Where, h = rise of the step; b = tread of the step



The sum of double rise and the tread gives a constant. From there, the pitch can be derived - usually 1:1.5 to 1:2.
To calculate the width of the steps, the formula used is **h + b = 450mm**
Additionally, to the pitch, the stairs will have a total rise and total run which are also important measurements.

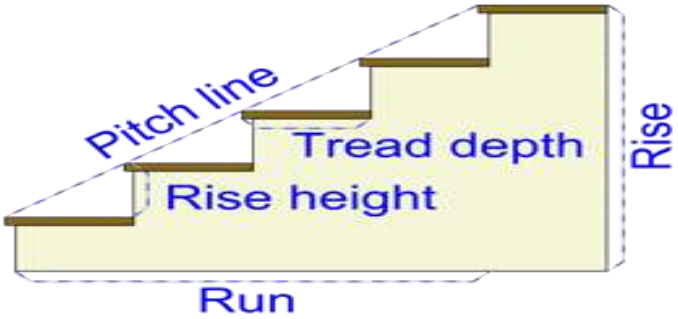
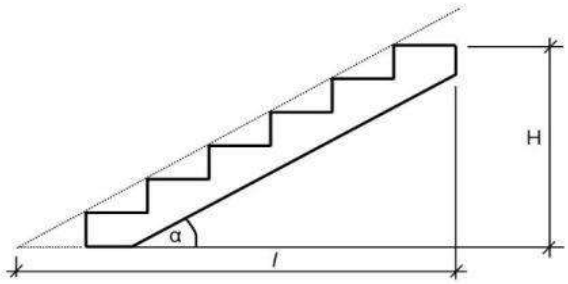


Image: Wikipedia



When building multi-turn stairs, you must also make sure that it has an uneven number of steps otherwise you must change legs when walking up the stairs. All steps must also have the same rise - human brain adapts to a certain rhythm of walking so if one step is of different height then it might cause you to trip on the steps (Pärnumaa, 2020).

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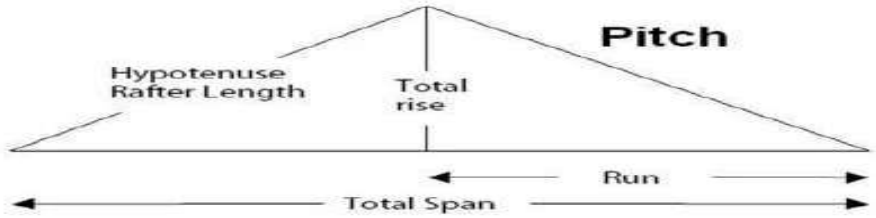
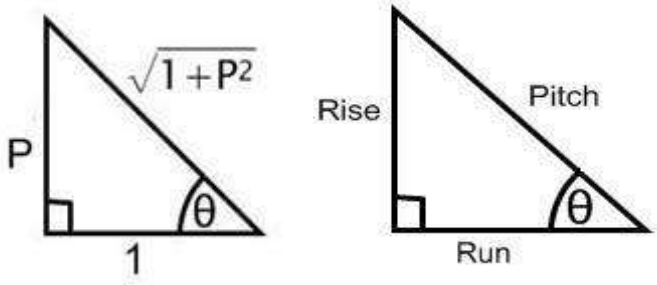
ROOFING AND MATHEMATICS CONCEPT



In roof design of buildings, the Pythagorean Theorem is also applied. There are various kinds of roofing designs. Gable roofs, for example, are made by placing two right triangles together. A Gable is a triangle formed by a sloping roof. A building may be front-gabled or side-gabled. The triangle relationships in roof construction can be explained with the following terms below:

The span: This is the length from the outside wall to the outside wall of a building.

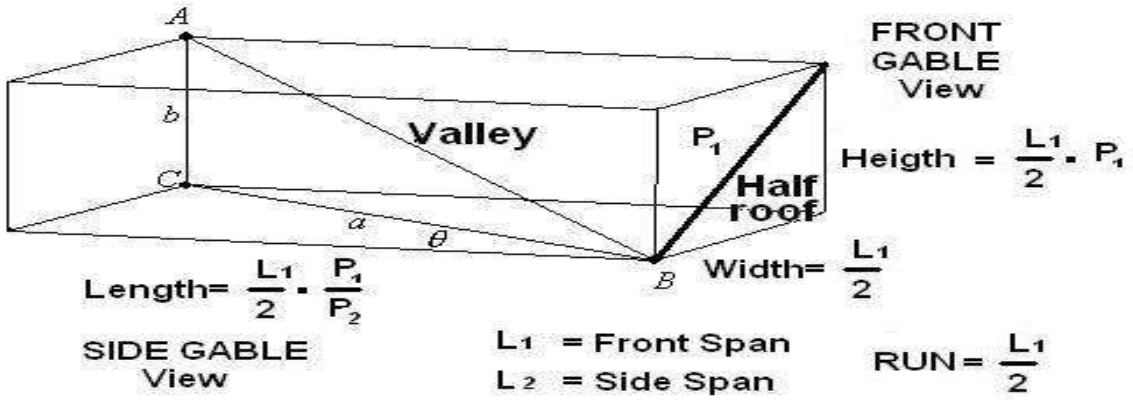
The run: The run is one-half the span. Units of run are typically based on 12 inches.



$$run(mm) = \frac{pitch(‰) * 1000}{rise} \quad rise(cm) = \frac{pitch(\%) * run}{100}$$

$$run(cm) = \frac{pitch(\%) * 100}{rise} \quad rise(mm) = \frac{pitch(‰) * run}{1000}$$

The pitch: The roof's pitch is its vertical rise divided by its horizontal span (or "run") -called slope in geometry or the tangent function in trigonometry. It is a ratio of vertical to horizontal measurements. If a plan calls for a 6/12 pitch roof, then the architect wants the slope of the roof to go up six inches for every 12 inches of horizontal run. Carpenters do not refer to the angle of roof as 30° but prefer to use the pitch of the roof. (Grazda et al, 1966)



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Conclusion

The application of mathematical principles in building design is one that began centuries ago and continues even in contemporary times. Kulbir (2006) observed that mathematics is a universal subject and its history presents a very good picture of the overall development of our civilization. Agwagah (2013) further asserted that mathematics is an indispensable tool in virtually all human endeavours and there is hardly any field where mathematics is not useful. This by implication puts the field of design into the equation which further underscores the universality of mathematics. As long as the human race exists, the need for mathematics will always arise. More building structures will be constructed and so, seeing the importance of mathematics in the world of architecture and engineering as well as in other areas that play a role in building design, mathematics should not be relegated to the background. Adebola (2007) indicated that the roles played by mathematics in the day-to-day activities of man is suggestive of the fact that mathematics is needed by all. Hence, efforts must be strengthened in order to train and help more people around us and all over the globe embrace mathematics and also to realize the indispensability of mathematics in the field of design. This paper has been able to show the interface of mathematics and design in some parts of a building structure which are: the foundation, the columns, beams, slabs, footings, stairs and the roofing.

Recommendation

Mathematic curriculum should be design to embrace practical principles to architectural designs.

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Influence of Quest for Materialism on Rate of Cyber-Crime Behaviour among University Undergraduate Students in South-South Geopolitical Zone of Nigeria

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Abstract

This study investigated Influence of Quest for Materialism on Rate of Cyber-Crime Behaviour among University Undergraduate Students in South-South Geopolitical Zone of Nigeria. The population for this study consisted of 316,280 undergraduates from public universities in South-South geopolitical zone of Nigeria. This study adopted the survey research design using a correlational approach. The sample size for this study was 1,800 undergraduates from twelve public universities in South-South Geopolitical Zone of Nigeria, which was selected using the multi-stage sampling procedure. The instrument for this study was the cyber-crime behaviour and predictors questionnaire. Data collected were analysed using inferential statistics involving linear regression analysis. The finding from this study established that Materialism would not significantly predict undergraduate cyber-crime behaviour. It is recommended that society should re-evaluate the societal norms and values that place too much emphasis on material acquisitions without proper means of income and the get-rich syndrome. Also, it was recommended that parents and guardians should help build strong value systems among their children and wards as they grow. This will help guide them against having excessive love for material things and money and reduce the "get rich" syndrome among our undergraduates.

Keywords: Materialism, cybercrime, internet, undergraduates.

Introduction

The future of the nation lies in the positive development of her undergraduates and youths. The rate at which undergraduates turn to cybercrime is worrisome. If cybercrime is not curtailed, Nigeria may degenerate to a level where people no longer place value on hard work; rather, they might value and worship money and success without a clear source of earning. Many undergraduate students may be paying less attention to their academic activities due to the lifestyle of some other undergraduates, which has become enticing to them. The impact of the internet on the academic development of Nigerian undergraduates may have been flawed by the evolution of the new waves of crime. The Internet may have become an environment where the most productive offense burgeons. Cyber-crime behaviour has become a surprise and a strange behaviour that is being exhibited by undergraduates in Nigeria. Nigeria has six geopolitical zone, South-West, South-east, South-south, North-central, North-west and North-east geopolitical zone. South-south geopolitical zone of Nigeria is made up of six states. There are nineteen public universities in South-South geopolitical zone of Nigeria. There have been reported cases of cybercrime in almost all states in Nigeria, making is a national issue. The cases are alarming day after day, with the new case more complex than the former. The South-south geopolitical zone of Nigeria has had her share of the case. According to Warf (2018), cybercrime is a type of fraud or deception that makes use of the Internet and could involve hiding information or providing incorrect information to trick victims and extort money, property, and an inheritance from them. Cybercrime is not considered a distinctive crime, but it covers a range of illegal and illicit actions that are committed within cyberspace. Cybercrime is a criminal activity in which a criminal offense is committed with the intention to harm an individual or a group of people, an institution, or a nation, using information communication technology available in the internet services and computers to trick victims out of their money, properties, inheritance, and other valuables and may involve arming institutions or nations. According to Attrill-Smith and Wesson (2020), cybercrime is an offense committed against an individual or group of individuals with a criminal motive to intentionally harm the reputation of the victim or cause physical or mental harm to the victim directly or indirectly by using modern telecommunication networks such as the Internet and mobile phones. The globalizing effect of introducing the internet to Nigeria did not only advance the state of technology in the country but also birth cybercrime. In Nigeria, cybercrime is popularly known as 'Yahoo Yahoo' or 'Yahoo Plus', or 'Next Level Cyber Criminals.' The Yahoo Yahoo cybercrime perpetrators tend to use voodoo power/magic to influence their potential targets, while the 'Next Level Cyber Criminals' engage in more complex schemes such as business email compromise and tax scams to defraud their potential victims (Adeniran, 2008; Essien, 2019).

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Cybercrimes can be easily placed into two categories: Violent and non-violent cybercrimes. Most of the cybercrimes are non-violent offenses because interaction is without any physical contact. Some of the non-violent cybercrimes are cyber trespass, cyber theft, corporate espionage, piracy, plagiarism, and cyber fraud. Cyber terrorism, Cyber-attacks, cyber stalking, and cyber bullying are examples of violent cybercrimes. The love for money may be the motivation for undergraduates to engage in cybercrime. Some undergraduates may desire a life of luxury, and as such, they seek it by all means. According to Fasanmi et al. (2015), Material wealth has taken centre stage in most individuals, including the undergraduates in Nigeria. Some undergraduates believe that having more money or things will make them happier and more fulfilled in life. Richins et al. (2004) conceptualize materialism as a three-dimensional construct defined by placing possessions and money at the center of one's life, believing that money brings happiness, and judging one's own and others' success based on income and possessions. Marissa (2022) averred that materialistic people are always looking for ways to acquire more money and more possessions. According to Marissa, materialistic people are more likely to have low self-esteem, be unhappy, and even make it harder for themselves to have healthy relationships. When you compare their habits and behaviours to the happiest people in the world, you realize that materialism doesn't bring true joy.

According to Oladayo (2013), the unrestrained quest for wealth in the Nigerian society is another factor driving young people to devise dubious ways of acquiring wealth rather than adhering to the rules set forth by society. It is possible that Nigeria's social system and corruption motivate young people to forgo hard work and foster an aspiration to get wealthy at any cost. According to Kasser (2018), being materialistic is seen as a negative trait because it is often associated with competitiveness and being manipulative, lacking empathy, or other selfish behaviours that most of us tend to avoid. Several studies have shown a link between materialism and cybercrime, particularly among young people. A study carried out by Swader (2016) revealed that materialistic individuals are the most supportive of fraud, bribery, and tax evasion, in contrast to non-materialistic individuals, who have the weakest degree of fraudulent support. Other studies have indicated that individuals owning excessive materials would be the most attracted to fraudulent and questionable practices, including cybercrime behaviour (Li et al., 2015). Adekanmbi and Ukpere (2020) examined the influence of materialism, job satisfaction, and perceived managerial trustworthiness on attitudes towards fraudulent behaviours among finance officers of selected universities across South-West of Nigeria. The result revealed that materialism significantly predicts attitudes toward fraudulent behaviour. The result proved a substantial main effect on attitude towards fraudulent behaviours among finance officers of designated universities across South-West Nigeria. The study concluded that attitude towards fraudulent behaviours is a determinant of how materialistic employees are. Idom and Tormusa (2016) carried out a study to ascertain the causes, types, and likely victims of cybercrimes among 384 participants accidentally selected from six higher institutions in South-South Nigeria. The results revealed that of the several causes of cybercrimes, materialism was identified as one of the major factors.

Pius et al. (2023) investigated self-control, materialism, and need for achievement as predictors of cybercrime behaviour among youths in the Ibadan metropolis. The study adopted an ex-post factor research design, while 200 youths in the Ibadan metropolis were conveniently selected to respond to four validated questionnaires: the Cybercrime Behaviour Scale, Brief Multidimensional Self-Control Scale, Materialistic Value Scale, and Need for Achievement Scale. Four hypotheses were tested using zero-order correlation, multiple regression, and t-tests of independent samples. All hypotheses were accepted at a $p < .05$ level of significance. The result revealed the need for achievement and materialism had a significant relationship with cybercrime behaviour, while self-control inversely correlated with cybercrime behaviour. Also, the result indicated that self-control, need for achievement, and materialism jointly predicted cybercrime behaviour. Furthermore, self-control, need for achievement, and materialism independently predicted cybercrime behaviour among the study participants. Finally, gender and employment status significantly influenced cybercrime behaviour among youths in the Ibadan metropolis. The study concluded that self-control, need for achievement, materialism, gender, and employment status are strong predictors of cybercrime behaviour among youths in the Ibadan metropolis. Eigbadon and Adejuwon (2015) investigate the psychological and demographic factors such as peer influence, materialistic value, impulsivity, self-control, age, sex, and highest educational factors as they predict Internet fraud tendency among youths that patronise cybercafés in South-western Nigeria. The study utilized a cross-sectional survey with an ex-post facto design; 986 youth internet users from Lagos and Ibadan were purposively sampled to participate in the study. The factors jointly predicted internet fraud tendency among internet users. Independently, peer

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influence and materialistic value were significant. In the 23% variation observed in the prediction, peer influence contributed 19.5% while materialistic values, age and sex contributed 3.5%. Ratzinger (2024) examines the implication of modernism and materialism on Nigerian youths from a philosophical view. Questions arising from the researcher are: Why are the Nigerian youths after excessive materialism? What are the things that push the Nigerian youths into excessive materialism? What are the side effects of modernism on the youths of this age? What is the endpoint of a materialistic youth? The researcher uses the analytic method in responding to these questions. The researcher found out that modernism and excessive materialism are consolidating negative effects on the lives, families, and mission mandate of a better tomorrow and better society. Daniel et al. (2022) investigates materialism, egocentrism, and delinquent behaviour in Chinese adolescents in Mainland China. Methodologically, the existing studies have several weaknesses, including small samples, cross-sectional research designs, and being limited to people living in Western cultures. Using two waves of data collected from Sichuan, China (N = 4981), the predictive effect of adolescent materialism on delinquency and the mediating role of egocentrism were studied. Over two occasions separated by six months, students aged 11 and above responded to a questionnaire evaluating adolescent materialism, egocentrism, and delinquency (mean Wave 1 age = 13.15, range between 11 and 20.38). Results of multiple regression analyses suggested that materialism at Time 1 positively predicted Time 2 egocentrism. Additionally, Time 1 materialism positively predicted the level and change in Time 2 delinquency. Finally, based on 5000 bootstrap samples with gender, age, ethnic group, and Time 1 delinquent behaviour as covariates, PROCESS analyses showed that egocentrism partially mediated the influence of Time 1 materialism delinquency and its change at Time 2.

Statement of The Problem

The Internet is supposed to be an indispensable tool in modern life, revolutionizing the way we communicate, work, learn, and entertain ourselves. The internet may have become a nest of organized crime; criminal groups now use the internet for organised crimes such as cyber terrorism, cyber fraud, identity theft, cyber bully, money laundering, and cyber stalking as opposed to the major reason for creating it. It may be possible that both educated and non-educated people are becoming victims of cybercrime. Cybercrime is one of the biggest problems in the banking industry, commerce industry, educational institutions, entertainment industry, and media industry. A lot of money and personal data are stolen every day through the Internet. Cybercrime among undergraduates has continued to gain popularity as many undergraduates are becoming attracted to the act. Many undergraduates in Nigerian universities have embraced cybercrime as a way of life and a means of improving their financial ability, especially as the unemployment rate keeps rising. Adejoh et al (2019) suggested that many young people get initiated into cybercrime as a result of their interaction with the so-called yahoo-boys and yahoo-girls as well as their quest to become rich and live a flamboyant lifestyle, especially when they compare their standard of living with those of others who are into the fraudulent act.

More alarming cases of cybercrimes perpetrated by the Nigerian undergraduates are being observed from all the geopolitical zones in Nigeria, with each new case more alarming than the previous one. The availability of the Internet and social media platforms to the undergraduates has further aggravated the extent of cybercrime involvement among undergraduates in Nigeria. Undergraduates may have seen cybercrime as an alternative source of income; as such, they feel at home among their peers and even family members when engaging in cybercrime behaviours. Undergraduates' love for material things is on the rise. This is evidenced in their use of Internet gadgets (iPhones, phones, and laptops), clothes, and luxury apartments; also, in the exotic cars some undergraduates drove on campuses and their lifestyles, which are executive. Signal from sign-off party by most undergraduates is another piece of evidence of their extravagant lifestyle and desire for more wealth and money. A lot of these undergraduates are believed to engage in cybercrime. Findings from studies by Udelue et al. (2020), Pius et al. (2023), and Ajake et al. (2024) have indicated a high level of cybercrime involvement among Nigerian university undergraduates. Some researchers have been able to conduct research, studying possible predicting factors of cyber-crime behaviours among undergraduate in South-East and South-West Nigeria, but none have carried out such study in South-South Nigeria using materialism as a predictor of cyber-crime behaviour. It is therefore imperative to examine whether materialism would predict cyber-crime behaviour among undergraduates in public universities in South-South Geopolitical Zone of Nigeria. Materialism, the excessive love for wealth and money, may be a significant factor in the prediction of undergraduates engaging in cybercrime behaviours.

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Objective of the Study

The main objective of this study was to examine the extent to which undergraduate's extreme love for material things predicts their involvement in cybercrime behaviour in the South-south geopolitical zone of Nigeria.

Research Question

The below research question was raised to guide the study:

1. Will materialism predict cyber-crime behaviour among undergraduates in South-South Geopolitical Zone of Nigeria?

Hypothesis

The below hypothesis guided the study and was tested at a 0.05 level of significance

1. Materialism will not significantly predict undergraduate cyber-crime behaviour in South-South Geopolitical Zone of Nigeria.

Methodology

This study adopted the survey design, using the correlational approach. The study sought to predict cyber-crime behaviour by the changing values of peer pressure. The population for this study consisted of 316,280 undergraduates from public universities in South-south geopolitical zone of Nigeria. The sample size for this study was 1,800 undergraduates from the six states in South-south Geopolitical Zone of Nigeria. The multi-stage sampling procedure was employed in the study. In the first stage, the stratified random sampling technique was used. Next, the simple random sampling technique was used to select twelve (12) universities out of the nineteen universities in South-south geopolitical zone of Nigeria. In the third and final stage, the simple random sample technique was used to select one hundred and fifty (150) undergraduates from each of the twelve (12) selected universities. The instrument that was used for this study is the Cyber-Crime Behaviour and Predictors Questionnaire. The instrument is a collection of items from other instruments that were adapted from different instruments. The Cyber-crime behaviour and Predictors Questionnaire have four (2) sections, 'A and B'. In establishing the reliability of the instrument for the study, the instrument was administered to twenty-three (23) respondents in one of the state universities in Edo State that is not part of the sample but part of the population. The hypothesis was tested using simple linear regression at 0.05 significance level.

Presentation of Results

Hypothesis 1: Materialism would not significantly predict undergraduate cyber-crime behaviour in South-south Geopolitical Zone of Nigeria.

Table 1: Simple Linear Regression Analysis of Materialism on Undergraduate Cybercrime Behaviour in South-South Geopolitical Zone of Nigeria.

Model		Sum of Squares	df	Mean Square	F	*Sig. (P-Value)*
1	Regression	235.865	1	235.865	1.27	.260
	Residual	334576.746	1798	186.083		
	Total	334812.611	1799			

R = .027, Adj.0R-Square = .000, (.260 > .05). **Not Significant.**

Table 2 shows the result of the predictive regression analysis of materialism on undergraduate cyber-crime behaviour in South-South Geopolitical Zone of Nigeria. From the table *F= 1.27, P-Value = .260* Testing at an alpha level of .05 the *F-Value* is not significant **(.260 > .05).** Hence the null hypothesis is retained. From the analysis, the Adjusted R-square value (.000) revealed that materialism accounts for a mere 0.0 % of changes in undergraduate cyber-crime behaviour. In summary, undergraduates love and value for material things will not determine their cyber-crime behaviour.

Discussion of finding

The findings from hypothesis one revealed that materialism will not significantly predict undergraduate cyber-crime behaviour in South-South geopolitical zone of Nigeria. Materialism doesn't directly predict cybercrime; it can act as a significant motivating factor and influence online behaviours in ways that increase both the likelihood of perpetrating and falling victim to cybercrimes. Many undergraduates who engage in cybercrime are wealthy, but they continue their education. Many don't flaunt their wealth on campus. Plagiarism which is cyber-crime behaviour is not carried out with the aim of making money, nor cyber bully done because of an extreme love for material things.

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Many undergraduates engage in cybercrime because they want a better life and a means to survive. This study did not detect strong evidence that materialism could account for cyber-crime behaviour. This means cybercrime behaviour among undergraduates is not a result of their materialistic nature. This study has proven empirically that it is safe to say cybercrime behaviour among undergraduates is not as a result of their excess desire for material things. The researcher agreed with the findings from this study because there are some undergraduates who are into cyber fraud but still invest in education, and some persons may not be aware they are into cyber fraud; some of them don't even show up with flashy cars and accessories. Egbochuku and Festus 2025 averred that some undergraduate students invest in education and other businesses. This buttresses the findings from this study that undergraduate excess love for material things will not predict cyber-crime behaviour. This collaborates with the findings of Egbadon and Adejuwon (2015), who investigated the psychological and demographic factors such as peer influence, materialistic value, impulsivity, self-control, age, sex, and highest educational factors as they predict internet fraud tendency among youths that patronize cybercafés in South-western Nigeria. The result shows a variation observed in the prediction; peer influence contributed 19.5%, while materialistic values, age, and sex contributed 3.5%. Meanwhile, the findings from this study didn't collaborate with the findings from Idom and Tormusa (2016), Udelue et al. (2020), Moga et al. (2021), Ukeachusim (2022), Pius et al. (2023), and Ratzinger (2024). The result of their study revealed that of the several predictors of cyber-crimes, materialism was identified as one of the major factors. It is therefore established that undergraduate's excess love for money and material things will not predict their cyber-crime behaviour.

Conclusion

While some theories suggest a link between materialism and cyber-crime behaviour, this research provides a unique contribution by offering empirical evidence that materialism is not a significant predictor of cybercrime behaviour among undergraduate students in South-South Geopolitical Zone of Nigeria.

Recommendations

It is recommended that society should re-evaluate the societal norms and values that place too much emphasis on material acquisitions without proper means of income and the get-rich syndrome. Also, it was recommended that parents and guardians should help build strong value systems among their children and wards as they grow up. This will help guide them against having excessive love for material things and money and reduce the "get rich" syndrome among our undergraduates.

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Correlation Between Availability of Infrastructural Facilities and Human Capacity Readiness on Implementation of Computer-Based Assessment in External Examinations among Secondary Schools in Nigeria

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Abstract

The transition from paper-based to computer-based assessment (CBA) has become a major focus of educational reform globally yet concerns remain regarding school readiness in developing contexts. This study examined the level of infrastructural and human capacity readiness for the implementation of CBA in secondary school science subjects for the West African Examinations Council (WAEC) and the National Examinations Council (NECO) in Nigeria. A descriptive survey research design was adopted. Data were collected from 40 public and private secondary schools using a structured questionnaire measuring ICT infrastructure, electricity and internet availability, digital competence of teachers and students, and administrative support. Descriptive statistics, independent samples t-tests, and Pearson product–moment correlation were used for data analysis at the 0.05 level of significance. The findings indicated that both infrastructural and human capacity readiness were generally low to moderate across schools. No significant differences were found based on school ownership or location. However, a significant positive relationship existed between infrastructural readiness and human capacity readiness. The study concludes that effective adoption of CBA in WAEC and NECO science examinations requires simultaneous investment in ICT infrastructure and human capacity development. A phased and equitable implementation strategy is recommended.

Keywords: computer-based assessment, infrastructural readiness, human capacity, science subjects, WAEC, NECO

Introduction

The 21st century has witnessed a transformative shift in global education systems, transitioning from traditional paper-based assessments to Computer-Based Testing (CBT). This transition is primarily driven by the rise of information and communication technologies (ICT), the growing need for scalable and secure testing systems, and a desire for more efficient, data-driven education solutions. Countries across the globe, including both developed and developing nations, have begun integrating digital assessment formats into high-stakes exams and classroom-based formative assessments. Globally, CBT is well established in countries like the United States, the United Kingdom, Singapore, and South Korea. In the U.S., tests such as GRE, GMAT, and TOEFL have long been computerized, offering real-time feedback and flexible scheduling (Educational Testing Service, 2022). Singapore's Smart Nation initiative has embedded CBT into national education strategies, enhancing personalization through data analytics (Ministry of Education Singapore, 2023). Even India has adopted CBT for its major exams such as the JEE and NEET, streamlining the examination process for millions of students. The benefits of CBT are numerous. First, digital assessments greatly improve efficiency, reducing the time and cost associated with traditional testing. Institutions report up to 60% in cost savings and significantly faster result processing (Ainsworth & Goodman, 2023). Additionally, CBT provides immediate feedback for formative assessments and enables the use of adaptive testing technology, which adjusts question difficulty based on the test-taker's performance (Gierl & Lai, 2022). CBT also strengthens assessment integrity through technological safeguards like biometric

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verification, encrypted submissions, and remote proctoring, which significantly reduce malpractice (OECD, 2023). Furthermore, CBT platforms are inherently scalable, capable of delivering exams to millions of candidates across multiple locations and time zones. Organizations like the International Baccalaureate (IB) have successfully implemented such models to deliver secure, timely assessments globally (IBO, 2022).

In Nigeria, the movement toward CBT began with the Joint Admissions and Matriculation Board (JAMB), which first piloted CBT in 2013 and fully transitioned by 2015. The motivation behind this shift included the need to curb widespread examination malpractice, reduce logistical complexity, and speed up result processing. Today, JAMB operates over 700 CBT centers nationwide, becoming a pioneer in African digital assessment reform (Omodara & Ayeni, 2022). JAMB's success has influenced other Nigerian examination bodies like the West African Examinations Council (WAEC) and National Examinations Council (NECO) to explore the adoption of CBT. However, their decentralized structures—which involve diverse school-based assessments in multiple subjects—pose greater challenges for full digital transition. Unlike JAMB's centralized testing system, WAEC and NECO must contend with variability in infrastructure and digital literacy across thousands of public and private secondary schools. The Nigerian federal government has supported digital transformation in education through strategic policies such as the National Digital Economy Policy and Strategy (2020–2030) and the National Policy on ICT in Education. These frameworks promote ICT infrastructure development, teacher training, and integration of digital assessment tools (Federal Ministry of Communications and Digital Economy, 2023). In line with these policies, WAEC and NECO have initiated pilot CBT programs, testing objective-type questions in science and commercial subjects. WAEC is considering a hybrid model, where multiple-choice questions are delivered digitally while essay-based questions remain paper-based. NECO has also tested CBT in selected schools in Lagos and Abuja to evaluate infrastructure and student readiness (WAEC Nigeria, 2023). Nevertheless, significant challenges remain. Prominent among these is infrastructural inadequacy, particularly in public secondary schools. This includes lack of functional computers, unreliable electricity, poor internet access, and insufficiently trained personnel. The digital divide between urban and rural areas complicates the uniform implementation of CBT. In Lagos State, often regarded as a microcosm of Nigeria due to its diversity and urbanization, progress has been made in integrating ICT into education. However, disparities persist, especially between well-equipped urban schools and under-resourced semi-urban and rural schools (Salami et al., 2024). Beyond infrastructure, other forms of readiness are crucial for effective CBT implementation. These include human capacity (training for teachers and technical staff), digital literacy (basic ICT skills for students and staff), financial investment (for purchasing and maintaining equipment), administrative policy readiness, and psychological preparedness to adopt a new system. For instance, students and teachers need to be comfortable with the CBT format, and school administrators must develop guidelines to ensure smooth test administration and data integrity. Some state governments have proactively supported CBT adoption. Lagos State has introduced CBT for internal assessments such as screening tests into its model colleges and has upgraded several public-school facilities (Lagos State Ministry of Education, 2023). States like Ogun and Ekiti are also experimenting with e-learning and digital assessment tools to build local capacity ahead of national rollout. To support broader implementation, global organizations such as the World Bank have recommended a phased approach starting with pilot testing, followed by strategic investment in infrastructure, and then gradual scale-up across regions. Capacity building for teachers, improved broadband connectivity, and stakeholder engagement are key strategies for overcoming the digital divide (World Bank, 2023). In conclusion, the evolution of CBT in Nigeria is gaining momentum, led by JAMB and increasingly supported by policy and technology investment. While WAEC and NECO are still in the early stages of CBT adoption, their pilot programs and collaborations with stakeholders mark a significant shift toward digital assessments. As the country continues its transition, evaluating infrastructural readiness at the secondary school level especially in a diverse and strategic state like Lagos is both timely and necessary. Such evaluation will provide critical data for policy makers, guide resource allocation, and ensure that the move toward CBT is inclusive, equitable, and sustainable. In the digital age, educational transformation is closely tied to the availability and quality of infrastructure. The integration of educational technology particularly Computer-Based Testing (CBT) has become a key strategy in advancing learning, assessment, and teaching efficiency. However, in many developing countries, including Nigeria, the success of digital innovations like CBT is significantly hindered by infrastructural limitations. Infrastructure in this context refers not only to physical tools like computers and internet access but also includes human, policy, and environmental support systems that enable equitable and sustainable digital education.

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Infrastructure is the foundational pillar that supports the adoption of CBT in schools. According to UNESCO (2022), effective integration of ICT in education depends on reliable electricity, internet connectivity, hardware availability, and skilled personnel. These infrastructural components determine how effectively digital learning and assessments can be deployed and accessed. For instance, while digital tools such as learning management systems and CBT platforms promise efficiency, they rely heavily on steady power supply, functional computer hardware, and fast internet access elements that are often lacking in public secondary schools in Nigeria. One of the most basic yet crucial components is electricity. Without consistent power, digital devices and computer labs cannot function effectively. National data (National Bureau of Statistics, 2023) shows that only about 37% of public secondary schools in Nigeria have reliable electricity. This significantly hampers both ICT instruction and the administration of computer-based assessments. Similarly, the shortage of functioning computers and related hardware (printers, servers, scanners) in schools means many students do not receive adequate exposure or hands-on training, deepening digital exclusion and widening the performance gap between public and private institutions (Ogunleye et al., 2023). Internet connectivity is another major challenge. A fast and stable internet connection is necessary for accessing educational content, conducting real-time assessments, and supporting remote proctoring. Yet, in many rural and underserved parts of Nigeria, internet access is limited or non-existent. The International Telecommunication Union (2023) states that less than 45% of schools in sub-Saharan Africa are connected to the internet, putting students at a disadvantage compared to their peers in more developed regions. Beyond physical infrastructure, human capacity is an equally vital dimension. The availability of trained ICT teachers and coordinators influences how well schools can implement and maintain CBT platforms. Many Nigerian teachers lack the digital literacy required to facilitate or supervise CBT. Akpan and Eyo (2023) report that more than 60% of Nigerian secondary school teachers have low confidence in managing CBT systems due to limited training and inadequate support. Therefore, training and professional development for educators are critical elements of infrastructural readiness. In response to these challenges, Nigeria has developed several policies to promote ICT integration in education. The National Policy on ICT in Education (revised in 2019) lays out clear goals to improve access to digital tools, train educators, and institutionalize CBT. It emphasizes the role of ICT as a transformative force in enhancing teaching, assessment, and lifelong learning (Federal Ministry of Education, 2019). This policy aligns with broader frameworks like the National Digital Economy Policy and Strategy (2020–2030) and the Nigeria Education Sector Strategic Plan (2018–2023), which advocate for digital transformation across all educational levels. Government initiatives such as those by UBEC, TETFund, and NITDA have provided funding for ICT centers, computer labs, and digital literacy training. A notable success story is JAMB's full adoption of CBT for UTME since 2015. With over 700 CBT centers across the country, JAMB's implementation has enhanced transparency, minimized exam fraud, and accelerated result processing (Akanbi & Adejumo, 2021). This has put pressure on other bodies like WAEC and NECO to explore CBT, leading to pilot programs and feasibility studies. Despite policy ambitions, implementation remains inconsistent, especially at the basic and secondary school levels. Infrastructural gaps persist, particularly in rural and low-income areas. Many state education boards have yet to fully align with federal ICT policies, creating disparities in digital readiness. However, the outlook remains positive with new initiatives like the Nigeria Education Cloud Project, which aims to centralize digital content, teacher training, and curriculum resources for nationwide use. In this national context, Lagos State stands out as a leader and model in digital education reform. As Nigeria's most populous and economically vibrant state, Lagos reflects a diverse and complex environment suitable for testing educational innovations. With over 22 million residents and a mix of urban and semi-urban settings, Lagos is often considered a microcosm of Nigeria (Lagos Bureau of Statistics, 2023). This diversity makes it an ideal case for assessing readiness for CBT. Lagos has demonstrated strong political and financial commitment to educational innovation. Initiatives like Eko Excel, supported by the World Bank, have enhanced learning outcomes by equipping teachers with digital tablets and training in technology-enhanced instruction (World Bank, 2022). Similarly, the Lagos State Examinations Board has introduced CBT for entry exams into model colleges, providing thousands of students with first-hand experience in digital testing. Furthermore, programs like the Lagos Smart School Initiative aim to equip 300 schools with solar-powered digital classrooms and broadband internet by 2025 (Lagos State Ministry of Education, 2023). Such efforts reflect a proactive stance toward bridging infrastructural gaps. Notably, Lagos also benefits from partnerships with tech companies such as Andela and EduTAMS, which support digital learning platforms and training. These collaborations enhance teacher capacity and provide models that other states can adopt.

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The relatively high level of teacher digital literacy in Lagos further strengthens its suitability as a benchmark for national CBT readiness. A 2023 survey by the Nigerian Educational Research and Development Council found that 65% of Lagos public school teachers had received digital training in the last three years, compared to the national average of 38%. This highlights the state's preparedness and positions it as a model for scaling CBT across Nigeria. However, the implementation of digital tools like Computer-Based Testing (CBT) faces a significant obstacle across the country due to the widening digital divide. This divide is defined by stark disparities in access to digital infrastructure, technological resources, and digital literacy, particularly between urban and rural areas, and between public and private schools. Addressing these disparities is crucial for achieving equity, fairness, and sustainability in Nigeria's transition toward digital assessment systems. The disparity in ICT infrastructure across Nigeria's educational landscape is among the most pressing challenges. Urban centers such as Lagos, Abuja, and Port Harcourt enjoy relatively well-developed digital infrastructure, including computer labs, reliable electricity, and internet access. Conversely, rural and semi-urban areas often lack the basic facilities needed for digital learning and testing. Ogunleye, Ajibola, and Falade (2023) underscore that rural schools frequently lack computer labs and trained teachers, effectively excluding students from participating in CBT or any form of digital education. A similar gap exists between public and private schools. Private institutions, particularly those serving affluent communities, are more likely to possess modern ICT infrastructure and trained personnel. These schools were better equipped to adapt to online learning during the COVID-19 pandemic, highlighting their technological readiness. In contrast, public schools, which cater to the majority of Nigerian students, remain critically under-resourced. The National Bureau of Statistics (2023) reports that fewer than 30% of public secondary schools have functional computer laboratories, while over 70% of private schools possess such facilities.

The implementation of CBT by the Joint Admissions and Matriculation Board (JAMB) since 2015 has exposed these digital inequities. Many candidates from rural or under-resourced schools struggled with CBT due to a lack of computer exposure or poor infrastructure at exam centers (Afolabi & Abioye, 2023). This reality puts these students at a disadvantage compared to peers in better-equipped schools, raising concerns about equity, fairness, and educational justice. The digital divide also affects other aspects of education, including curriculum delivery, teacher professional development, and the acquisition of digital skills among students. The National Policy on ICT in Education (FME, 2019) outlines the government's digital inclusion goals, but implementation remains weak due to inadequate funding, lack of political will, and poor monitoring. The situation is compounded by unreliable electricity—particularly in rural areas—making it difficult to sustain ICT facilities. While solar alternatives exist, they are yet to be widely adopted. Furthermore, a severe shortage of trained ICT personnel exacerbates the divide. Teachers in rural and public schools often lack the training to deliver digital content or supervise CBT. Akpan and Eyo (2023) found that only 34% of rural teachers had received formal ICT training in the past five years, compared to 68% in urban schools. Without professional development and support, the potential of digital learning remains untapped. Addressing these issues requires a multi-pronged strategy. First, significant investment must be directed toward equipping public and rural schools with ICT infrastructure. Second, teacher training must prioritize digital competencies. Third, partnerships between government, private sector, and NGOs can help scale innovative solutions like solar-powered ICT labs and affordable digital devices. Finally, policy implementation should be context-sensitive and include frameworks for equitable access.

In terms of educational outcomes, CBT aligns well with the competencies required in the 21st century critical thinking, problem-solving, and digital literacy. Unlike traditional paper-based tests, CBT platforms support multimedia integration, adaptive questioning, and real-time feedback, making assessment more dynamic and learner-centered (Ugwuegbulam & Eze, 2023). CBT can include open-ended and scenario-based questions, thereby assessing deeper cognitive skills. Problem-solving, a key 21st-century skill, is also enhanced through CBT. By integrating tools like simulations, virtual labs, and interactive diagrams, CBT replicates real-world challenges and allows students to apply theoretical knowledge in practical settings. Furthermore, digital literacy is promoted through consistent exposure to computer interfaces, building students' confidence and readiness for technology-driven workplaces. The Nigerian Educational Technology Research Group (2023) confirms that regular CBT users show higher digital proficiency. Globally, CBT is now standard in many assessments, such as the GRE, GMAT, and PTE (ETS, 2022). JAMB's adoption of CBT has helped normalize the format in Nigeria, showing improvements in efficiency and transparency (Adegboyega & Ojo, 2023). However, equity remains a concern. Without inclusive access, CBT can marginalize already disadvantaged students.

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Premature CBT implementation carries risks. System failures such as software crashes, power outages, and poor internet connectivity can derail exams and undermine trust. JAMB experienced such issues during its early CBT rollouts. Another problem is the lack of a maintenance culture. Government-provided ICT tools are often poorly maintained, leading to wasted investments and non-functional labs (Ogunleye et al., 2023). Electricity remains a persistent barrier. According to the Nigerian Educational Research and Development Council (NERDC, 2023), over 60% of public schools suffer daily power outages, with few alternatives. Such instability affects CBT reliability and risks data loss during exams. Moreover, teachers remain underprepared for CBT administration. Many lack the digital fluency to train students or troubleshoot problems during exams. Without robust ICT training, teachers cannot effectively support digital assessment. Akpan and Eyo (2023) report that only 38% of public school teachers feel confident with CBT. These challenges highlight the risk of deepening educational inequality. Students from well-equipped schools may perform better not due to superior knowledge, but due to digital familiarity. To prevent this, CBT rollouts must be preceded by readiness assessments, infrastructure investment, and targeted support.

Bridging the Digital Divide in Nigeria's Secondary Education through Computer-Based Testing

The promise of digital transformation in education has opened new frontiers for teaching, learning, and assessment globally. However, in Nigeria, this shift has highlighted a widening digital divide, particularly in secondary education. The disparities between urban and rural areas, public and private schools, and well-resourced versus under-resourced regions are stark. These gaps pose significant challenges to the equitable implementation of Computer-Based Testing (CBT) and other educational technologies. Access to ICT infrastructure is a major indicator of this divide. Urban areas like Lagos, Abuja, and Port Harcourt are relatively well-equipped with computers, internet connectivity, and trained ICT personnel. By contrast, many rural schools lack reliable electricity, functional computer labs, and ICT-competent staff (Ogunleye, Ajibola, & Falade, 2023). According to the National Bureau of Statistics (2023), only about 30% of public secondary schools in Nigeria have functional computer laboratories, whereas over 70% of private schools are better equipped. This infrastructure gap has clear implications for the fair deployment of CBT. When JAMB transitioned to CBT in 2015, disparities in digital preparedness among students became evident. Candidates from public or rural schools struggled with registration and the actual examination process due to lack of familiarity with computers, unreliable internet, and insufficient access to practice platforms (Afolabi & Abioye, 2023). These limitations disproportionately affected students from less privileged backgrounds, raising concerns about equity and meritocracy. Beyond assessment, the digital divide affects teaching quality, curriculum delivery, and students' readiness for a technology-driven future. While the Nigerian government has established digital inclusion goals in the National Policy on ICT in Education (FME, 2019), execution has been inconsistent due to financial constraints, weak political will, and inadequate monitoring. The root causes of the divide include inadequate electricity supply, high internet costs, limited teacher training, and poor maintenance of ICT tools. In many rural areas, schools operate without grid electricity, which makes running computers or maintaining a stable internet connection difficult. Though solar alternatives exist, they remain underutilized. According to the International Telecommunication Union (2023), less than half of Nigerian schools have internet access. Teacher capacity is another major hurdle. A study by Akpan and Eyo (2023) showed that only 34% of rural secondary school teachers had received ICT training in the past five years, compared to 68% in urban schools. Without capable facilitators, digital integration efforts are bound to fail. While several national and regional studies have explored CBT readiness, few have focused specifically on Lagos State. As Nigeria's most populous and technologically advanced state, Lagos holds unique significance. Its diverse population, relatively better infrastructure, and proactive education policies make it a suitable model for assessing digital reform potential. For example, Adegboyega and Ojo (2022) reported that only 42% of schools in Kwara State had functional ICT facilities, with low teacher training levels. Similarly, studies in Enugu and Anambra (Okonkwo & Umeh, 2021) revealed critical deficits in hardware, internet access, and electricity. However, these findings, while valuable, do not capture Lagos's distinct readiness profile. JAMB's 2022 report indicated that although over 700 CBT centers were accredited nationwide, 30% failed basic infrastructure checks. While Lagos fares better than most, its public schools still face disparities in ICT access, especially between elite urban centers and semi-urban or low-income districts. There remains a need for a Lagos-specific study to identify readiness levels across Local Government Education Authorities (LGEAs), distinguish gaps between public and private schools, and provide evidence for targeted policy intervention.

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The global shift toward digital education and assessment has prompted many countries, including Nigeria, to consider the adoption of Computer-Based Assessment (CBA) in large-scale examinations. In response to growing demands for efficiency, transparency, and digital literacy, key examination bodies such as the West African Examinations Council (WAEC) and the National Examinations Council (NECO) are exploring the feasibility of transitioning from traditional paper-based formats to computer-based systems, particularly in science subjects where practical and conceptual understanding are critical. However, the readiness of Nigerian secondary schools especially in terms of infrastructure and human capacity remains a major concern (NERDC, 2023; Afolabi & Abioye, 2023). Despite policy efforts such as the National Policy on ICT in Education (FME, 2019), there exists a wide disparity in access to digital infrastructure and skilled personnel across Nigerian schools. Many secondary schools, particularly those in rural areas or under public management, lack basic infrastructure such as functional computer laboratories, stable electricity, and reliable internet access (Ogunleye, Ajibola, & Falade, 2023). This infrastructural inadequacy compromises equitable access to digital assessments and risks excluding students from disadvantaged backgrounds. Moreover, human capacity gaps exacerbate the situation. A significant proportion of science teachers in public and rural schools lack the digital competence required to effectively integrate technology into instruction or supervise computer-based examinations (Akpan & Eyo, 2023). Inadequate teacher training, absence of ICT support staff, and poor maintenance culture further weaken the operational foundation needed for the successful implementation of CBA. Additionally, socio-demographic variables such as school ownership (public vs. private), location (urban vs. rural), and students' socio-economic status play moderating roles in access to and readiness for CBA. Private schools in urban areas are more likely to possess the infrastructure and expertise required for computer-based science assessments, while public schools in rural areas often lag behind (National Bureau of Statistics, 2023). These disparities risk deepening educational inequality and undermining the credibility of national assessments, especially if digital assessment is prematurely deployed without adequate systemic preparation. Given these challenges, there is a critical need to evaluate the current state of infrastructural and human capacity readiness across different categories of secondary schools in Nigeria. Such an evaluation will provide empirical insights into the feasibility, equity, and sustainability of implementing computer-based assessment in science subjects for WAEC and NECO. Without this foundational knowledge, any large-scale digital transition risks failure, exclusion, and erosion of public trust in the national examination system.

Theoretical frameworks

This study is anchored on Technology Readiness Theory (TRT), which explains the extent to which individuals and institutions are prepared to adopt, accept, and effectively utilize new technologies. Technology Readiness Theory conceptualizes readiness as a multifaceted construct influenced by four core dimensions: optimism, innovativeness, discomfort, and insecurity. Optimism reflects the belief that technology offers increased efficiency, transparency, and effectiveness, while innovativeness captures the willingness to be among the first to experiment with new technological systems. In contrast, discomfort refers to perceived difficulty or lack of control when using technology, and insecurity represents concerns about reliability, accuracy, and potential failure of technological systems. Within the context of computer-based assessment in secondary school science subjects, these dimensions provide a useful lens for understanding institutional and human capacity readiness. Optimism and innovativeness are reflected in school management support, positive perceptions of CBT, and willingness to invest in digital assessment infrastructure. Conversely, discomfort and insecurity manifest through inadequate ICT facilities, unreliable electricity and internet access, limited technical support, and low confidence among teachers and students in using computer-based assessment platforms. Thus, Technology Readiness Theory offers a robust framework for interpreting variations in infrastructural readiness, administrative commitment, and stakeholder confidence observed in this study.To further explain the human capacity component of readiness, this study is complemented by the Technological Pedagogical Content Knowledge (TPACK) framework, which emphasizes the integration of technology, pedagogy, and subject content as a prerequisite for effective teaching and assessment. In science education, the successful implementation of computer-based assessment requires teachers not only to possess basic technological skills but also to understand how digital assessment tools can be aligned with pedagogical strategies and science content. TPACK therefore provides a theoretical basis for examining teachers' digital competence, their ability to supervise CBT sessions, and their preparedness to integrate computer-based assessment into science instruction. Technology Readiness Theory and TPACK offer a comprehensive theoretical lens for this study by linking infrastructural conditions, institutional support, and human capacity with the effective implementation of computer-based

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assessment. While TRT explains overall preparedness and attitudes toward technology adoption, TPACK elucidates the specific competencies required of teachers to implement CBT effectively in science subjects. This combined framework supports the examination of readiness as both a systemic and pedagogical phenomenon within the Nigerian secondary school context.

Methodology

The population comprised public and private secondary schools offering science subjects and preparing candidates for WAEC and NECO examinations. The study focused on schools within Nigeria, with particular emphasis on institutional readiness rather than student achievement outcomes. This study employed a descriptive survey research design using a quantitative approach for data collection. The design was considered appropriate because the study sought to systematically examine the existing level of infrastructural and human capacity readiness for computer-based assessment (CBA) in secondary school science subjects, without manipulating any variables. Unlike experimental designs, the descriptive survey approach allows researchers to gather data from naturally occurring school settings and obtain a realistic picture of institutional readiness across different categories of schools. The choice of a survey design enabled the researchers to capture variations in readiness based on school ownership, location, and socio-economic characteristics, while maintaining ecological validity. Additionally, the quantitative approach facilitated the use of numerical data and statistical techniques such as descriptive statistics, independent samples *t*-tests, and correlation analysis to determine differences and relationships among key variables. This approach provided a balanced compromise between internal validity and generalizability, allowing the findings to be extrapolated to comparable secondary school contexts preparing candidates for WAEC and NECO examinations.

Sample and Instrumentation

The sample for this study consisted of 40 secondary schools, drawn from both public and private schools offering science subjects at the senior secondary school level. Schools were selected using a stratified sampling technique, based on ownership (public and private) and location (urban and rural), to ensure adequate representation of diverse school contexts. Respondents included science teachers, ICT coordinators, and school administrators who were directly involved in assessment processes and ICT-related activities within their schools. These respondents were considered appropriate for the study because of their direct involvement in examination preparation, ICT usage, and administrative decision-making related to assessment practices. Their roles positioned them to provide informed and reliable responses on infrastructural availability, digital competence, and institutional preparedness for computer-based assessment.

Data were collected using a researcher-developed questionnaire titled "Computer-Based Assessment Readiness Questionnaire (CBARQ)". The instrument comprised 25 items structured on a four-point Likert scale ranging from *Strongly Agree (1)* to *Strongly Disagree (4)*. The questionnaire was organized into five sections measuring: availability and functionality of ICT infrastructure, digital literacy of teachers and students, CBT implementation experience, administrative and policy support, and general perception of CBT readiness. To ensure content validity, the instrument was subjected to expert review by specialists in science education, educational technology, and measurement and evaluation. Their assessments focused on the relevance, clarity, and coverage of the items in relation to the study objectives. Revisions were made based on the experts' recommendations. The reliability of the instrument was determined using Cronbach's alpha, which yielded a coefficient exceeding 0.70, indicating acceptable internal consistency for research purposes.

Data collection

Data for this study were collected using the computer-Based Assessment Readiness Questionnaire (CBARQ) developed by the researchers. Prior to administration, permission was obtained from relevant school authorities, and respondents were informed of the purpose of the study and the voluntary nature of participation. The questionnaire was administered electronically using Google Forms. The Google Form link was distributed to respondents through WhatsApp messaging, leveraging existing school-based and professional WhatsApp groups comprising science teachers, ICT coordinators, and school administrators. This approach was adopted to enhance accessibility, improve response rates, and facilitate efficient data collection across geographically dispersed schools. Respondents were allowed adequate time to complete the questionnaire, and submissions were automatically recorded upon completion, reducing the risk of data loss and transcription errors. The use of an online platform ensured anonymity, as no personally identifying information was collected. Data collection was conducted within a defined time frame to ensure consistency in responses and to minimize

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the influence of external factors. Throughout the data collection process, care was taken to ensure that participation did not interfere with normal school activities. All responses were treated with strict confidentiality, and the data obtained were used solely for research purposes.

Ethical Considerations

Ethical standards were strictly adhered to throughout the conduct of this study. Approval and permission were obtained from relevant school authorities before data collection commenced. All participating schools and respondents were adequately informed about the purpose of the study, the procedures involved, and the voluntary nature of participation. No information relevant to the study was withheld from participants. Respondents were assured that participation would not disrupt normal school activities or examination schedules. It was clearly communicated that respondents could withdraw from the study at any stage without any negative consequences. Confidentiality and anonymity were maintained by ensuring that no identifying information was included in the questionnaire, and all data collected were used strictly for research purposes. The study posed no physical, psychological, or professional risk to participants, and all procedures conformed to accepted ethical standards in educational research.

Data Analysis

The data collected were coded and analyzed using appropriate statistical procedures. Descriptive statistics, including mean and standard deviation, were used to determine the levels of infrastructural and human capacity readiness for computer-based assessment in secondary school science subjects. Mean scores were interpreted based on the response scale to establish whether readiness levels were low, moderate, or high. Inferential statistics were employed to test the research hypotheses at the 0.05 level of significance. Independent samples *t*-tests were used to examine differences in infrastructural readiness based on school ownership (public and private) and differences in human capacity readiness based on school location (urban and rural). The choice of the *t*-test was appropriate because it enabled comparison of mean scores between two independent groups. To examine the relationship between infrastructural readiness and human capacity readiness, the Pearson Product–Moment Correlation technique was used. This method was considered suitable for determining the strength and direction of the relationship between the two continuous variables. Where applicable, effect sizes were reported to complement statistical significance and enhance interpretation of the findings.

Presentation of Results

This study set out to evaluate the infrastructural and human capacity readiness for implementing Computer-Based Assessment (CBA) in science subjects across secondary schools in Lagos State, Nigeria. The findings provide a nuanced, data-driven snapshot of the challenges and dynamics shaping Nigeria's transition to digital assessment. The overall low-to-moderate readiness scores for both infrastructure (M=1.98*M*=1.98) and human capacity (M=2.29*M*=2.29) align closely with recent national and regional studies. Ogunleye and Adekunle (2024), in a study of Southwestern Nigerian schools, similarly reported that only 34% of schools met the basic ICT readiness threshold for digital assessment. This consistency across studies underscores a systemic rather than localized deficit. Despite the proliferation of policy frameworks like the National Digital Economy Policy (2020–2030), implementation at the school level remains fragmented (Federal Ministry of Communications and Digital Economy, 2023). The moderate human capacity score, slightly higher than infrastructure, may reflect recent post-COVID-19 in-service training efforts documented by Nwosu et al. (2023), who noted a surge in teacher digital literacy initiatives across Lagos and Ogun states. However, without commensurate investment in hardware and connectivity, such training risks being theoretical rather than practical.

The comparison between public and private schools showed that although private schools recorded higher mean infrastructural readiness scores, the difference was not statistically significant. This finding contrasts with earlier studies that reported significant advantages for private schools (Afolabi & Abioye, 2023). The absence of a statistically significant difference in this study may reflect recent government interventions and pilot ICT projects in public schools, particularly in urban areas, which may have narrowed the infrastructure gap.The non-significant difference in infrastructural readiness between public and private schools (p=.13*p*=.13, d≈0.60*d*≈0.60) appears to contradict earlier national findings, such as those of the National Bureau of Statistics (2023), which indicated that over 70% of private schools had functional computer labs compared to fewer than 30% of public schools. This discrepancy may be explained by the unique socio-educational landscape of Lagos State. As noted by Salami et al. (2024), Lagos has aggressively pursued public-school ICT upgrades

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through initiatives like *Eko Excel* and the *Lagos Smart School Project*, partially bridging the traditional resource gap. Furthermore, Adeyemi and Lawal (2023) observed that many mid-tier private schools in urban Lagos face similar constraints as public schools—particularly rising costs of maintenance and internet access which may level the playing field. Nevertheless, the moderate effect size suggests a meaningful practical difference that, with a larger sample, might reach statistical significance. This highlights that policy success in Lagos may not be generalizable to states without similar political commitment and economic leverage.

Similarly, the comparison between urban and rural schools indicated that urban schools demonstrated higher human capacity readiness, but the difference was also not statistically significant. This suggests that location alone may not fully explain readiness levels. While urban schools generally have better access to ICT exposure, the lack of significant difference may be due to limited nationwide teacher training and inconsistent professional development opportunities across locations. This finding supports Akpan and Eyo's (2023) assertion that teacher digital competence remains generally inadequate regardless of school location. The lack of a significant difference in human capacity readiness between urban and rural schools ($p=.24$ $p=.24$, $d\approx0.37$ $d\approx0.37$) is surprising given the well-documented digital divide. However, recent studies suggest that location alone may be an incomplete predictor. Ige and Ojo (2024) found that in Lagos, proximity to tech hubs and state-sponsored training programs had reduced the urban–rural competency gap among teachers, even where infrastructure lagged. Conversely, Okeke and Nwankwo (2023) argue that "rural" in Lagos often refers to peri-urban areas with better connectivity than isolated villages in other states. The small effect size still indicates that urban schools retain an edge, likely due to greater access to informal learning networks, tech support, and continuous professional development opportunities factors less captured by infrastructure metrics alone. This suggests that human readiness is influenced by ecosystem factors beyond school walls, including community access to technology and local digital economies.

The significant positive correlation between infrastructural and human readiness ($r=.55, p<.001$ $r=.55, p<.001$) is perhaps the most compelling finding of this study. This reinforces the Resource-Access-Use-Competency (RAUC) model proposed by Afolabi et al. (2022), which posits that sustained access to functional technology is a prerequisite for the development of authentic digital competence. Schools with reliable computers and internet are more likely to integrate technology into daily instruction, thereby fostering teacher confidence and student familiarity (Ugwuegbulam & Eze, 2023). Conversely, in schools where infrastructure is absent or unreliable, teachers have few opportunities to practice digital skills, leading to competency atrophy and innovation aversion (Akpan & Eyo, 2023). This interdependence has critical policy implications: investments must be integrated and simultaneous. Providing tablets without training—or training without working devices yields diminishing returns, as seen in the failed tablet initiatives in some Northern states (Bashir & Sani, 2023).

Implications of the Study

The findings pose both challenges and pathways for national examination bodies. First, the variability in readiness even within a single state calls for a differentiated, phased implementation strategy. WAEC's proposed hybrid model (digital for objective items, paper for essays) is a pragmatic start (WAEC Nigeria, 2023), but must be paired with mandatory readiness certification for participating schools. Second, the strong infrastructure–human capacity link suggests that teacher development programs should be hosted in well-equipped schools or ICT hubs to ensure training is practical and applied. Third, JAMB's existing CBT infrastructure could be leveraged in the short term for WAEC/NECO science practicals or mock exams, as suggested by Akanbi and Adejumo (2021) in their analysis of cross-agency collaboration.

Limitation and Future Study

While this study provides valuable, timely insights into the readiness landscape for Computer-Based Assessment in Nigerian secondary schools, several limitations must be acknowledged to contextualize the findings and guide future research. Regarding geographic scope, the study expanded beyond a single state to include selected schools from Southwestern states and the Federal Capital Territory (Abuja), offering a more diverse perspective than a Lagos-only study and capturing meaningful regional variation in policy implementation and resource allocation. However, it did not constitute a fully nationwide, stratified sample. Consequently, the findings may not fully represent the extreme infrastructural and socio-political challenges prevalent in Nigeria's North-East, North-West, or South-East regions, where ICT policy implementation is often inconsistent, and factors like insecurity or difficult terrain further complicate digital

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access (Bashir & Sani, 2023). This regional gap highlights the need for caution when generalizing the study's conclusions. Future research should pursue several critical directions. First, a comprehensive, nationally representative readiness audit stratified by geo-political zone, school ownership, and location is essential to create an evidence-based, detailed roadmap for examination bodies like WAEC and NECO. Second, employing mixed-methods approaches would deepen understanding; qualitative interviews with teachers, students, and ICT coordinators could reveal the experiential, attitudinal, and psychological dimensions of CBT readiness not captured by quantitative scales. Third, investigating context-appropriate and sustainable infrastructure models is urgent. Research into the efficacy and cost-benefit of innovations like solar-powered ICT labs, offline-first assessment platforms, and mobile-based testing solutions is critical for schools in regions with chronically unreliable grid power and internet connectivity (World Bank, 2024).

Conclusion

This study evaluated the infrastructural and human capacity readiness of Nigerian secondary schools for the implementation of Computer-Based Assessment in science subjects for WAEC and NECO examinations. The findings revealed that readiness levels across schools remain generally low to moderate, indicating that many schools are not yet fully prepared for a complete transition to computer-based assessment. The study found no statistically significant differences in readiness based on school ownership or location, suggesting that readiness challenges cut across public and private schools as well as urban and rural settings. However, the existence of a significant positive relationship between infrastructural readiness and human capacity readiness underscores the importance of adopting an integrated approach to digital assessment reform. The findings imply that policymakers and examination bodies must prioritize system-wide capacity building, rather than assuming that infrastructure alone or teacher training alone will suffice. Investments in ICT infrastructure must be accompanied by sustained professional development for teachers, deployment of ICT support staff, and clear administrative policies to support CBT adoption. In conclusion, while Computer-Based Assessment holds considerable promise for improving efficiency, transparency, and assessment quality in Nigerian secondary education, its successful implementation for WAEC and NECO science examinations will depend on deliberate, equitable, and phased readiness enhancement across schools.

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Evaluation of Social and Biological Determinants of Miscarriages among Pregnant Women in Shinkafi Local Government Area of Zamfara State, Nigeria

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Abstract

This project work is aimed at finding the biological and social implications of miscarriage among women in Shinkafi local government area, Zamfara state. From the data obtained, there are several factors responsible for the cause of the problem. These factors include genetic factors, infection of some diseases, excessive consumption of alcohol and cigarettes, and so on. It is also found that miscarriage can lead to bladder injuries, pelvic inflammatory disease Amaenia, and infertility, and to many other effects. Some preventive and curative measures are also found, such as eating a good balanced diet, visiting the hospital regularly, and avoiding alcohol and smoking. Recommendations on the way forward are finally stated. From the findings of the study, it has been recommended that there is a need to strengthen maternal health services in Shinkafi, which requires improved access to quality antenatal care, early screening for risk factors, and community-based education on reproductive health. Policies should prioritize addressing socio-economic determinants such as poverty, nutrition, and healthcare infrastructure to reduce preventable miscarriages. Collaborative efforts between government, healthcare providers, and local communities are essential to ensure culturally sensitive interventions that enhance maternal outcomes and safeguard women's reproductive health.

Key Words: Miscarriage, Determinants, Maternal Health, Women, Shinkafi, Zamfara State

Introduction

In this study, an attempt was made to find out the biological and social implications of miscarriage among women in Shinkafi local government. A miscarriage cannot occur without conception (pregnancy), which in humans takes nine months period during which a single cell is transformed into a human being. Pregnancy can also mean the fertilization of a male sperm cell and a female egg (Ovum) to form a zygote (Encarta encyclopedia 2004). The complication in pregnancy is what brought about miscarriage; about 15% of all pregnancy ends in miscarriage, most of which occur between the 4th and 12 weeks of pregnancy (McNestry, Killeen, Crowley, & McAuliffe, 2023; Quenby et al., 2021). Termination of

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pregnancy can happen to women of all ages and parties. These pregnancies are usually terminated at any stage before 28 weeks of gestation. Although the vast majority are terminated before four weeks of gestation, miscarriages are viewed as a form of abortion through natural Determinants which are unintentional(Abdallah, 2025; Yong, Yeo, & Shorey, 2023). Each year in the world, hundreds of women are affected by miscarriage. According to Bupa (2003), research has found that as many as one quarter of pregnancies miscarry, the riskiest time being between 6th and 8th weeks, dating from the last menstrual period in the vast majority of cases. Having a miscarriage does not mean that someone will not be able to get pregnant again, and most women go on to have a successful pregnancy(Abdallah, 2025) (Ruth and Brown 2001). There are so many types of miscarriage: threatened miscarriage, inevitable miscarriage, incomplete miscarriage, complete miscarriage, and missed miscarriage. The common Determinants of miscarriage include fetal or embryonic structural abnormalities of the genital tract, diseases such as excessive consumption of alcohol, and cigarette smoking(Al-Akaidi et al., 2024).

Statement of the Problem

Miscarriage research is not well funded and there has been little progress over many decades. Early pregnancy loss is still blamed on either chromosomal abnormality in the implanting embryo or on some 'maternal' factor, such as an exaggerated immune response to placental cells (Asghari, Novinbahador, Mehdizadeh, Zolfaghari, & Yousefi, 2024; Dwivedi, Khan, Ahmad, Mehdi, & Ali, 2024). Consequently, couples suffering RPL are routinely tested for various anatomical, endocrine, immunological, clotting and genetic risk factors(Cao et al., 2023; Turesheva et al., 2023). The above observations made the researchers to investigate the biological and social implication of miscarriage among women in Shinkafi local government are Zamfara state. Find out the possible Determinants and associated diseases of this problem, which are some of the problems to be addressed by this study.

Purpose of the Study

The purpose of this research work is to find out the biological and social implication of miscarriage, and also to come up with some suggestions on the way to minimize the occurrence of the problems among the women in Shinkafi local government area Zamfara state.

Significance of the Study

The findings of the study would be of great significance to the people of the study area, Zamfara state, and Nigeria at large by providing them with the information's of the occurrence, Determinants, implication and other related information's of the problems. Government (local, state and federal) will also be punished with this information's which can be used to set up a programme so as to see the end of the problem.

Scope of the Study

This research is only restricted to Shinkafi local government area Zamfara state which consist of the following because of some constraints.

Research Questions

The following are research questions were answered in this study:

1. Is cervical incompetence among the Determinants of miscarriage?
2. Do infections such as Chlamydia and rubella cause miscarriage?
3. Does pelvic inflammatory disease cause miscarriage?
4. Is a nutritional deficiency cause miscarriage?
5. Does excessive consumption of alcohol among the Determinants of Miscarriage?
6. Is a genetic factor a cause miscarriage?

Literature Review

Previous literature related to the present study was reviewed as follows:

Concept of Miscarriage

Miscarriage in human means loss of an embryo or fetus before the 20th weeks of the pregnancy. The medical term for miscarriage is spontaneous abortion; carriage is very common approximately 20% of pregnancies (one in five) end in miscarriage. The most common cause is a genetic abnormality of the fetus; not all women release they are miscarrying and others may not seek medical care when it occurs(Leibovitz, Lerman-Sagie, & Haddad, 2022; Phoswa & Khaliq, 2021) Moulder, 1995).

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Miscarriage is often a traumatic event for both partners and cause feelings similar to the loss of a child or other member of the family. Fortunately, 90% of women who have had one miscarriage subsequently have a normal pregnancy and healthy baby, 60% able to have a healthy baby after two miscarriages even a woman who has had three miscarriages in a row still has more than a 50% chance of having a success pregnancy, the incidence of miscarriage reported varies depending on the degree of reporting of miscarriage in the area studied(Coomarasamy et al., 2021; Quenby et al., 2021; Wang et al., 2025). Many of the very early miscarriage (4 to 6 weeks amenorrhea) may not be actual miscarriages; rather these may be short periods of amenorrhea followed by heavy period being reported as pregnancies, especially by the very anxious relatively infertile middle-aged women. The physical effect of a miscarriage tends to clear up quickly. Any bleeding settles down within seven to ten days (7 to10) and the next period will return in around six weeks. Sometimes infection can make the bleeding last longer or cause an offensive discharge(Wang et al., 2025; Wisniak et al., 2025) (Bupa, 2003)

Symptoms and signs of Miscarriage

Bupa (2003), states some symptoms of miscarriage; the commonest symptoms is vaginal bleeding, which can range from light spotting to heavier than a period. There may be blood clots or other tissue that is clearly identifiable. Sometimes a sac-like structure is seen some bleeding is very common during pregnancy and vaginal bleeding does not always signal a miscarriage has taken place especially if the bleeding light and only last a short time. Bleeding that is prolonged and heavy, like a period is more likely to lead to miscarriage. Often, there is cramping with period type pain some women find that the usual symptoms of pregnancy such as breast tenderness, feeling sick and having to pass urine more frequently than usual may stop unexpectedly. Sometimes there are no symptoms, and your miscarriage may only be discovered in a routine scan. If you have vaginal bleeding at any time during pregnancy, you should contact your doctor or midwife immediately for advice. An impending miscarriage will often have some distinct symptoms, such as vaginal bleeding and abdominal cramping, but having these symptoms in pregnancy does not always mean a miscarriage. If you have any of these symptoms, please see a doctor as soon as possible for a medical evaluation.

Determinants of Miscarriage

Miscarriage has several known Determinants such as: -

Genetic Factors: Structural abnormalities of the genital tract such as retroversion of the uterus, bicorn ate uterus fibroids are some of the genetic factors responsible for miscarriage. In over 60% miscarriage, there is problem with the way genetic materials from the egg and sperm combines as a result of fertilization. About half of all early miscarriage happens because of the problem in the way of genetic materials (Chromosomes), combine when the egg and sperm has joined during fertilization likely t be due to chance than any underlying problem with either you or your partner (Bupa, 2003)

Infection: - Acute infectious diseases such as nephritia (kidneys diseases), diabetes and severe trauma, uterine malformation including tumors are responsible in some instances, some infections such as listeriosis (Listeria infections) and Malaria are also thought to cause miscarriage more likely, other infections such as Chlamydia and rubella, renal diseases and typhoid dysfunction, severe vitamin deficiency has been shown to play a role in miscarriage (Bupa, 2003)

Implantation Problem: the fetus may fail to implant into the lining of the womb. Doctors don't fully understand why this happens, but sometimes it can be due to hormonal unbalance. Another fetal cause is where a cause in determine, 50% of miscarriages are due to chromosomal abnormalities of the conceptus (Bupa, 2003)

Environmental Factor: - Such as excessive consumption of alcohol and cigarette smoking has increased the risk of miscarriage. There is no enough evidence to show whether or not stress is a risk factor for miscarriage, but it's a good idea to take time during the day to relax. And doing moderate exercise having sex while you are pregnant, does not increase your risk of miscarriage (Bupa, 2003)(Xiang, Jiang, Mu, Wu, & Zhang, 2025).

Hormonal Imbalance: - Imbalance in pregnancy hormones and hormone deficiency has been shown to play a role in miscarriage as found in women who are subject to recurrent miscarriage. Other Determinants of miscarriage can be extreme anxiety and other psychological disturbances may contribute to the premature expulsion of the fetus, and problem associated with the immune system, these are also immunological Determinants (such as insulin dependent diabetes) and diseases associated with viruses oral condition where your body's own defense mechanism attacks itself, leading to blood clots in the placenta (Bupa, 2003)(Megakaryocyte, Polymorphonuclear, Monoblast, & Eosinophil, 2025).

Research Design

This research design is a cross-sectional design, because the study was designed to collect data from various experience people and well-trained, qualified people, which helped the research to collect firsthand information.

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Population of the Study

The population of the study comprised medical and experienced people in the field of the study, in Shinkafi Local Government Area, Zamfara State.

Sample and Sampling Techniques

Because of the wide area and population, the entire population cannot be covered. Therefore, a simple random sampling method was used for selecting the data from respondents, and in order to do this, a total of 100 respondents were selected, 25 from the entire population, which includes 10 medical professionals and 15 experienced people in the field of study in Shinkafi General Hospital.

Instrumentation

This simply refers to the construction of a research instrument for the collection of data; the set of questionnaires is expected to cover the areas.

Statistical Method

The set of questions in the questionnaire used in the study comprised open and closed-ended questions. To determine the total scores of each question from the questionnaires were computed in a Table with figures.

These were finally calculated in a simple percentage through the use of the formula as shown below: -

$$\text{Frequency} = \frac{\text{Number of the responses}}{\text{Total number of the responses}} \times \frac{100}{1}$$

Presentation of Results

The main purpose of this chapter is to present and interpret the data collected during fieldwork for the research. To enable us to answer the research questions in the first chapter of this research work, a total of seven (7) questionnaires were produced and administered; all were completed and returned. Therefore, the analysis was based on seven (7) using simple percentages, as shown below:

Q1. Is cervical incompetence among the determinants of miscarriage?

Table 1

S/N	Response/options	Respondents	Percentage (%)
1.	Yes	20	80
2.	No	5	20
	Total	25	100

From the above table (Table 1) we can detect that the majority of the respondent's i.e. 80% said cervical incompetence is among the cause of miscarriage, while 20% said cervical incompetence cannot cause miscarriage.

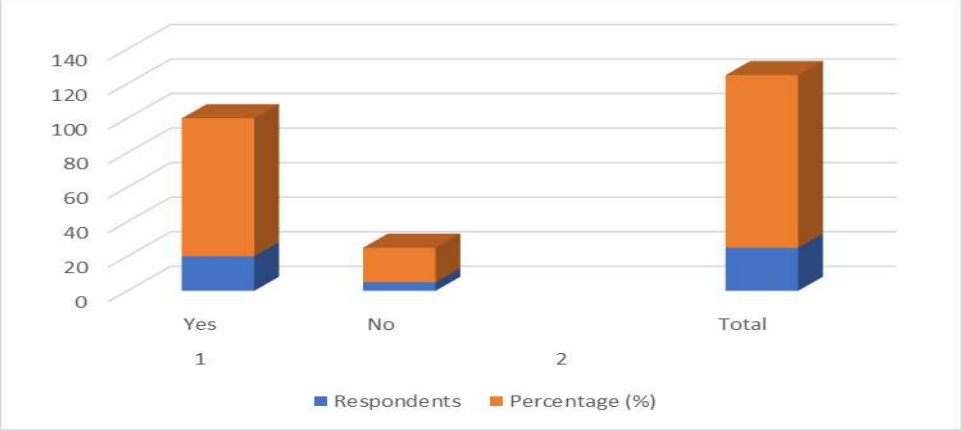

Figure 1.

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Q2. Does the infection such as Chlamydia and rubella cause miscarriage?

Table 2

S/N	Response/ options	Respondents	Percentage (%)
1.	Yes	25	100
2.	No	0	0
	Total	25	100

The above table (Table 2) shows that all the respondents said that Chlamydia and rubella can cause miscarriage.

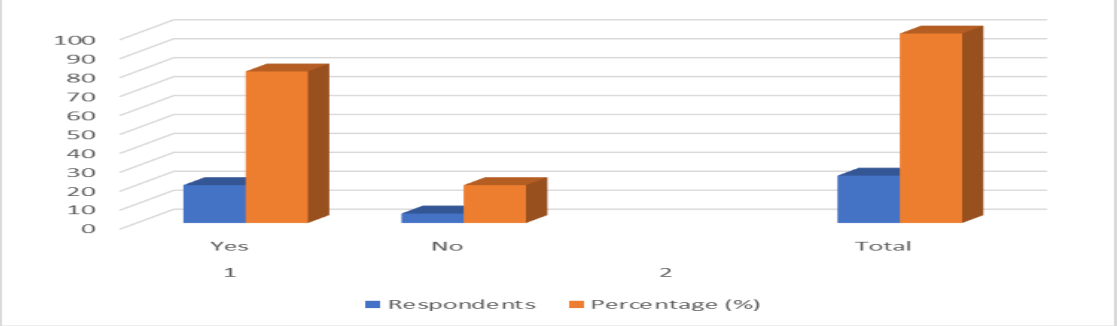

Figure 2.

Q3. Does pelvic inflammatory disease cause miscarriage?

Table 3

S/N	Responses/ options	Respondents	Percentage (%)
1.	Yes	21	84
2.	No	4	16
	Total	25	100

From the above Table 3, almost all respondents, i.e. 84% agree that pelvic inflammatory disease can cause miscarriage, and a few, i.e. 16% said that pelvic inflammatory disease is not associated with miscarriage.

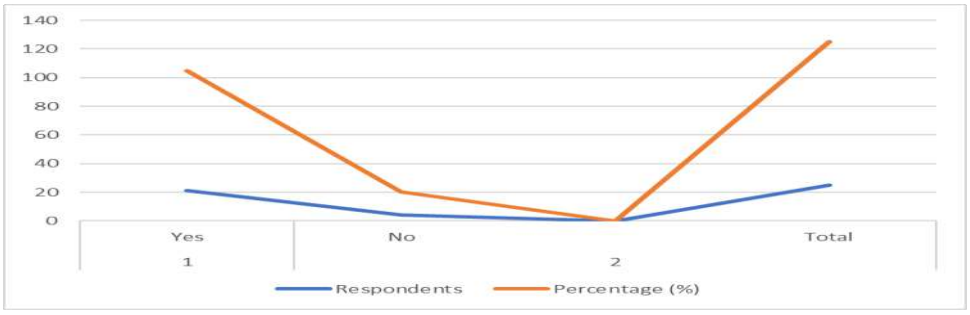

Figure 3.

Q4. Is nutritional deficiency can cause miscarriage?

Table 4

S/N	Response/ options	Respondents	Percentage (%)
1.	Yes	15	60
2.	No	10	40
	Total	25	100

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From Table 4 above, we can deduce that 60% of the respondents opined that miscarriage is caused by nutritional deficiencies. While others, that is 40% said no.

Q5. Does excessive consumption of alcohol contribute to miscarriage?

Table 5

S/N	Responses/ options	Respondents	Percentage (%)
1.	Yes	8	32
2.	No	17	68
	Total	25	100

From Table 5, it can be observed that 32% of the respondents said miscarriage can be caused by excessive consumption of alcohol, while 68% said that excessive consumption of alcohol cannot cause miscarriage.

Q6. Are genetic factors determinants of miscarriage?

Table 6

S/N	Responses/options	Respondents	Percentage (%)
1.	Yes	25	100
2	No	0	0
	Total	25	100

All the respondents said that the genetic factor is one of the Determinants of miscarriage.

Q7. Does miscarriage cause loss of blood?

Table 7

S/ N	Responses / options	Respondents	Percentage (%)
1.	Yes	25	100
2.	No	0	0
	Total	25	100

All the respondents said yes to this question.

The findings of this study include: from table one the result founds that the majority of the respondents said that the cervical incompetence is among the cause of miscarriage, while the minority of the respondents said that the cervical incompetence cannot cause miscarriage; from table two (2) all the respondents said that Chlamydia and rubella can cause miscarriage; from table three most of the respondents agree that pelvic inflammatory disease can cause miscarriage, while a few said that pelvic inflammatory disease is not associated with miscarriage; from table four the majority of the respondents stated that miscarriage is caused by nutritional deficiencies, while the minorities disagree; from tale five it can be observed that the minority of the respondents said that miscarriage can be caused by excessive consumption of alcohol, while the majority disagrees.

Discussion of Findings

After the data of this research work has been conducted, genetic factors such as the structural abnormalities of the genetic tract such as retroversion of the uterus, infection like nephritis (kidney disease) diabetes, severe trauma, tumors, infection include listeriosis, Chlamydia and rubella, implantation problem (this is a situation where by the fetus fail to implant into the living of the womb), hormonal imbalances and hormone deficiency, environmental factors such as excessive consumption of alcohol and cigarette smoking are all among the Determinants of miscarriage Armenakas & Scharf 2007. Other Determinants of miscarriage may include extreme anxiety and other psychological disturbances, which may contribute to the premature expulsion of the fetus. Therefore, 50% of miscarriages are due to the genetic and structural abnormalities and chromosomal abnormalities of the conceptus (Moulder, 1995). Also, on the other hand, the implication of miscarriage is bladder injury, bowel injury, loss of blood, likely occurrences of the miscarriage, pelvic inflammatory diseases, anemia, infertility, tubal blockage, incompetent cervix, miscarriage can also cause a range of findings which include anxiety, depression, anger, and even suicide Bupa, 2003). Where there is a case of pelvic inflammatory diseases after miscarriage, since the vagina and uterus, along with the fallopian tube, are affected, their natural protective barriers

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are disturbed with them; give room for bacteria and other infections organism that Determinants infection of the pelvic contain the uterus and fallopian tube. The infection of the tube will come from tubal blockage with other adhesions (Robert, 2007; Turvey & Cooley, 2014). And because the urinary tract is closed, then called urinary tract infections death may also occur after miscarriage. Moreover, ways of preventing miscarriage that were recommended by most of the respondents were regular antenatal check pregnant women should always visit the hospital further check as soon as they notice that they are pregnant, eating balance diet, losing any excessive weight by exercise and by not smoking or drinking too much alcohol earn help to reduce the risk of having miscarriage Petrozza (2006).

Conclusion

In conclusion, this research work has found the possible Determinants of miscarriage, it also found those that are mostly affected, and the possible implications of this problem are also found out, other finding of this work includes the prevention, cure, and complications of this disease; effort made by the Government to minimized occurrence of this disease, and problems are also found.

Recommendation

On the basis of the preceding discussion on miscarriage Biological and social implications of miscarriage among women in Shinkafi Local Government Area, Zamfara State, the following recommendations are vital.

1. There is need to educate the general public about the major implications of miscarriage, so that they will be taken by the pregnant women avoid the several cases of miscarriage.
2. Regular antenatal visit, reporting not noticed symptom for miscarriage to the medical doctor is also advisable to pregnant women, husband, and parents.
3. Necessary measures of preventing miscarriage, as indicated in chapter two, such as avoidance of smoking, eating a balanced diet, and improvement of nutritional standards and improvement of good sanitary conditions, need to be enlightened by the Government.
4. The Government should also take serious action on ways of preventing rampant miscarriage.

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Assessment on Mode of Instructional Technology and Use of Media in National Open University of Nigeria: A Historical Perspective

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Abstract
The National Open University of Nigeria (NOUN) has experienced significant growth and development in its use of instructional technology and media over the past two decades, yet there is a dearth of research on the trajectory of this evolution. This study therefore addresses this gap by analyzing NOUN's use of instructional technology and media from 2003 to 2023. The study employed a mixed methods approach, combining qualitative and quantitative data collection and analysis methods. The instruments adopted and validated for the study were official documents and structured questionnaire tagged, Questionnaire on Mode of Instructional Technology and Media (QMITM) with the reliability co-efficient (r=.89). Qualitative data were analysed thematically while quantitative data were analysed using mean ranking. The findings of the study revealed that there was a clear progression in the instructional technology and media employed by NOUN, with online study materials being the most widely adopted mode, achieving a mean score of 0.93. The study concluded that without deliberate efforts to strengthen institutional capacity and enhance policy execution, the goals of accessibility, quality assurance, and sustainability in open and distance education will remain unattainable. The study therefore, recommended that NOUN should invest more in improving internet accessibility and the stability of its online learning platforms to accommodate all learners, regardless of location.

Keywords: Historical Analysis; National Open University of Nigeria; Instructional Technology; Media.

Introduction
The importance of instructional technology to distance education practice cannot be over-emphasized. Braimoh (2015) stated that technology enables individuals to gain access to education, information and resources at anywhere, place and time. The increase in information and communication, according to (COL, 2000), as they are applied to educational process, has created a new set of students, who are not merely restricted to the brick-and-mortar classroom (Ojo, Ogidan and Olakulehin, 2000). Adekanmbi (1992) asserted that media are the materials and equipment used in communicating didactic information between the tutor and learner in distance education, while Adeosun (2015) stated that technological infrastructures should include adequate internet bandwidths and effective internet access such as functional workstation, instructional website and internet server portal. The emergence of computer-network communications in the 1980s and 1990s, and recent technological advancement in the areas of video transmission, e-mail, the internet as well as the World Wide Web greatly influenced tutor-students' interaction in distance education (Oyeomi, 2018). Many people gained access to computer-linked telephone lines. With the use of computer conferencing on the World Wide Web, tutors and students present text, pictures, audio, and video. File sharing and communications tools like e-mail, chats and audio and video conferencing are integral to the Internet mode. Despite the initial pessimism in U.S.A., Holmberg (2008) revealed that with the introduction of Information and Communication Technology that enhanced online communication, many distance learning and virtual universities emerged all over the globe. These institutions employ the internet to deliver classes and seminars. Thus, they conduct teaching-learning majorly online to opportune students whose computer system meets technological requirements of the institution to earn certificate. There are now virtual universities which are fully online. Moreover, Michigan Virtual University (Olayinka, 2015). The U.S. Centre for Education Statistics reported that about 75% of public 4-year institution and 62% of public 2-year institution offered DE courses in 1997-98 with more than1.66 Million enrolments in more than 54 distance education courses. Technologies with higher fixed costs and lower variable costs such as radio can be inexpensive if they serve large numbers of students and recurrent costs are managed. Studies have shown that Interactive Radio Instruction (IRI) in primary schools can deliver learning more cost-effective than textbooks or

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increased teacher training. Technologies with higher variables cost such as personal computers, may increase quality but are unlikely to bring any cost advantage (Holmberg, 2008). Ameritech (1996) and Porter (1994) contended that "as resources shrink and learning requirements expand, many educational institutions depend on communication technologies, such as distance learning to enhance the effectiveness and efficiency of education". Morrison (1996) also asserted that telecommunications software and internet have eliminated walls and boundaries in distance education. He stated that "an increasing number of students want and need non-traditional, flexible schedules". Porter (1994) also emphasized enhancement of independent learning materials through the use of interactive communication technologies and tutor mediation. Omoniyi (2006) also mentioned that effective use of technology can decrease interpersonal relationship and create comradeship and intimacy among students. On the other hand, instructional media refers to various or different channels by which instruction is passed from the tutor to the learner. However, the interactive media in distance education identified by Holmberg (2005) are non-contiguous communication and face-to-face sessions. The available media for non-contiguous interaction are usually the written, recorded, computerized telephone conversation, television and computer conferencing. Correspondence completely dominated the scene until the end of the twentieth century and in most parts of the world, whereas electronic mail and telefax to a considerable extent now replace postal communication (Holmberg, 2005). Distance education instructional media are classified by Adelakun (2010) as print, face-to-face contact, electronic, audio-visual and computer. (i) Print (Postal, Books, Journals, Magazines, Monographs, Postal services); (ii) Face-to-face during contact session (Writing Boards, Demonstrative/ Instructional tools – hand, mouth); (iii) Electronic-audio (Instructional Radio, Audiotape recorder and cassette, Telephone Tutoring, Audio graphics, Educational Radio, Audio Conferencing); (iv) Audio-visual (Video cassette, Video Discs, Interactive Video Conferencing, Educational Television); (v) Computer (Games, Computer-Assisted instruction, Web-Based Instruction, Computer- Mediated Instruction and Computer Conferencing).

Print Materials and Distance Education: Printing press and the postal services really paved the way for well-planned and systematic approach to flexible ODL programme. Print materials served as the fundamental element of distance education: radio, broadcast television, video tape, telephone, satellite television, and cable are latter developments (Moore and Kearsely, 1996). Rowntree (1992), Moore and Kearsley (1996) established that print is the most common form of instructional delivery in distance education institutions. This assertion was further stressed by Bates (1993) who submitted that in spite of the more influential institutions that made use of other media such as television and audio at the end of 1980's, the vast majority of distance education institutions throughout the world was still primarily print-based'. Holmberg (2005) also observed that reading from texts is found to be easier than reading from the computer screen. Having surveyed institutions across many continents, Perry (1984) discovered that distance education institutions in Africa made 100% use of correspondence and print materials in their programmes while Asia and Latin America made use of 93% and 72% respectively. It must be mentioned that this finding is no more applicable to the accredited distance education providing institutions in Nigeria. The institutions now employ multimedia technology in addition to print. Moore and Kearsely (1996) however attributed the predominant reliance and use of print technology to being inexpensive, easy distribution through the public mail or private delivery services. Adekanmbi (2004) also posited that the continued use of print in Africa and many other developing countries is due to its cheapness and easy accessibility. Peters (1998) equally submitted that print permit great economics of scale through industrialized methods of producing standard course packages, which permits individualization of learning. Adekanmbi (2004) further explained that despite the challenges of print, there is still constant romance with it and the transformation, in its context. It is now improved in terms of better prepared texts, high quality course material developmental process, and improved desktop development practices. Even, with regards to the United Kingdom Open University (UKOU) which has a major information and communication technology element, UNESCO (2003) asserted that printed materials continue to be the mainstay of distance learning provision for programmes, and plays multiple roles either as a lead or supporting medium and suitable to combine with variety of other media. Radio and Distance Education: Radio is ranked next by scholars to print media in distance education due to general low cost and availability. Radio is most often used as a supplement, in conjunction with other instructional delivery modes. It is pedagogically considered as a hard teaching medium where skills, or difficult ideas and concepts, or systematic and comprehensive development of knowledge is required. It is pedagogically considered as a hard teaching medium, where skills or difficult ideas and concepts, or systematic and comprehensive development of knowledge is required.

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Ojokheta (2010) also established that in recent times, the use of non-broadcast audio-visual media appears to be on the increase, particularly audio cassettes which have proven to be extremely popular as well as cost-effective. This is applicable in Nigeria due to erratic power supply. Perry's survey found that 42% of African, 38% of Asian, 70% of Australian, and 24% of Latin American distance education institutions make use of audio cassettes to complement teaching and learning. In another study, Bates (1996, 2005) pointed out that audio and video cassettes have radically affected the ratio between fixed and variable costs for audio and video learning. Thus, distance education institutions with relatively small enrolments, less than 1000, should be able to take advantage of audio-visual teaching methods since cassettes represent lower fixed costs relative to variable costs than broadcast methods or media.

Information and Communication Technologies (ICT) such as the internet access, e-mail, CD-ROMs, telephone, online data base, library services are paramount to learning at the National Open University of Nigeria (NOUN). Access to information through ICT increases the information accessible to students to support them in trying new strategies, thinking and creativity that are reflective in practice (Ololube, 2006). ICT provides opportunities students and academic and non-academic staff of NOUN to communicate with one another more effectively during formal and informal teaching and learning (Yusuf, 2005). According to Yusuf (2006), successful distance education cannot be achieved without the use of effective communication and technological tools such as e-mail, fax, internet, television, radio etc. Higher education institutions across the world have been adopting ICT teaching and learning technologies in an effort to create an enabling environment for both students and their instructors to engage in collaborative learning and gain access to information (Ifie, 2006 in Ololube). ICT can be used in distance learning to simplify administration, course design, development of materials, course delivery, evaluation and assessment. Despite the adoption of distance education by the federal and state governments in Nigeria, the low penetration of ICT has impeded proper implementation of the programme by institutions of higher learning (Ololube, 2006a). Ololube (2007) also established that an assessment conducted of the available resources conducted in August 1999 for delivering distance education at the CDLCE indicated that there were inadequate facilities for both present and future needs (Moja, 2000). Computer Technology and Distance Education: Computer technology offers the opportunity to search on the World Wide Web (www). It is a good medium for tutor-learner interaction, exchange of views and experiences among a group of students, organized synchronous conference, mock-up of work process etc. (Holmberg, 2008). The highly interactivity of computers distinguishes them from all previous technologies (Omoniyi, 2006).

Web and Distance Education: Moore and Kearsely (1996) stated that recent technology include Computer-Based Instruction (CBI) which uses the computer as a self-contained teaching machine to present individual lessons, electronic mail, computer conferencing and world-wide web applications. The web includes various audio or video capabilities, textbooks, study guides; workbooks and course syllabi that are available on the web rather than in the traditional format.

Mobile Phones and Distance Education: Interactions on mobile phones help students to obtain oral dialogue to supplement written explanation of tutors (Drunica, Bush, Garz, and Deiterschule (2003). Mobile technologies such as phones, tablets, electronic readers etc., according to UNESCO (2012), are currently assisting educators by aiding their works with students or by helping the tutors to improve their own pedagogical and content knowledge. Mobile phones have the potentials to expand educational access to population of tutors and students outside the reach of traditional education, provide a portal to guide educational content, send educational content to socio-economically disadvantaged learners, help to providing educational opportunities to families living in marginalized waterside communities, improve educational administration, enhance teachers' professional development and so on. Despite the evident progress in instructional technology and media utilization at the National Open University of Nigeria (NOUN), accessibility and effectiveness of these online study materials in enhancing teaching and learning outcomes remain an issue. Although online resources have become the dominant instructional mode, disparities in digital literacy, internet connectivity, and user engagement may limit their full potential. Moreover, the reliance on online platforms raises concerns about content quality, learner support, and the inclusiveness of technologically disadvantaged students. Hence, it becomes imperative to critically examine how the increased adoption of online instructional media translates into improved learning experiences and academic performance among NOUN students.

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Research Objective

The study aimed to historically analyse the modes of instructional technology and media that were available in the National Open University of Nigeria from 2003 to 2023

Research Questions

1. What was the historical perspective of modes of instructional technology in the National Open University of Nigeria?
2. What types of media technology were available in NOUN within the period 2003 to 2023?

Methodology

The study adopted descriptive survey research design within mixed method. Historical research method was also adopted for the study. This is because the researcher assessed and explained past events concerning National Open University of Nigeria. According to Saidu (2014), historical research involves investigating, recording, analyzing and interpreting the events of the past for the purpose of making generalizations that are helpful in understanding the past, the present and to a limited extent, in anticipating the future. Historical researchers could make use of two major sources of information namely: primary and secondary sources. The primary sources are data provided by the eye witnesses to the incident. It is also regarded as firsthand information. The secondary sources are records or accounts prepared by someone other than the person(s) who participated in or observed an event. Secondary source is also known as second hand information (Abdulrahman, 2012). Both sources of information were used in carrying out this study. This study being a historical research type employed both primary and secondary sources of information to gather data used. The primary source of information for this study included one instrument. The two instruments were used for the study. These were:

1. Historical documents
2. Interview Schedule for Stakeholders of National Open University of Nigeria (ISSNOUN)

The cross validity of the instruments was achieved and authenticity of historical sources were established in their own peculiar ways and these generally involve the rigorous dual process of external and internal criticisms. According to Osokoya (1996), the external criticism of historical sources affirms the authenticity of the data collected. It concerns itself with determining whether the document is a true one and not a forged one. The internal criticism establishes the reliability, accuracy, authenticity, and worth of the data obtained. In validating the historical facts of this study, the data were verified by comparing secondary sources with primary information. Where discrepancies arose among the sources, the investigator established the accuracy of the facts based on their overall plausibility, considering internal consistency, independent corroboration, general compatibility, and agreement with other known and accepted facts. The Crobach Alpha formula used to determine the reliability of the questionnaires on development of NOUN yielded reliability coefficient of 0.96. With the help of five research assistants who are graduates of NCE were given 1- day training on how to approach, interact, relate and administer the research instruments to NOUN's staff and students visited all the selected sample locations for formal introduction and sought their cooperation in the course of administration of the questionnaire. The questionnaire were thereafter administered to the sample. Furthermore, the researcher personally visited the National Open University of Nigeria Study Centres for official documents and administration of questionnaire. Other places of visit were Federal Ministry of Education and National University Commission (NUC). With regard to the secondary data, the researcher made use of relevant textbooks, journals, articles, thesis and reports on National Open University of Nigeria (NOUN).In history, data are usually analyzed by adducing facts and interpreting evidences available to the researcher. Therefore, the qualitative data obtained for this study were analyzed using thematic analysis to be in line with historical style of data analysis as stated earlier while, the quantitative data for the study were analyzed using descriptive statistics of mean, percentage, frequency count and mean ranking.

Presentation of Result

Research Question 1*: What was the historical perspective of modes of instructional technology in the National Open University of Nigeria?*

To address the research question on the historical perspectives of modes of instructional technology and media that were available in the National Open University of Nigeria (NOUN) from 2003 to 2023, both descriptive (for the survey) and thematic (for the interview) analyses were conducted.

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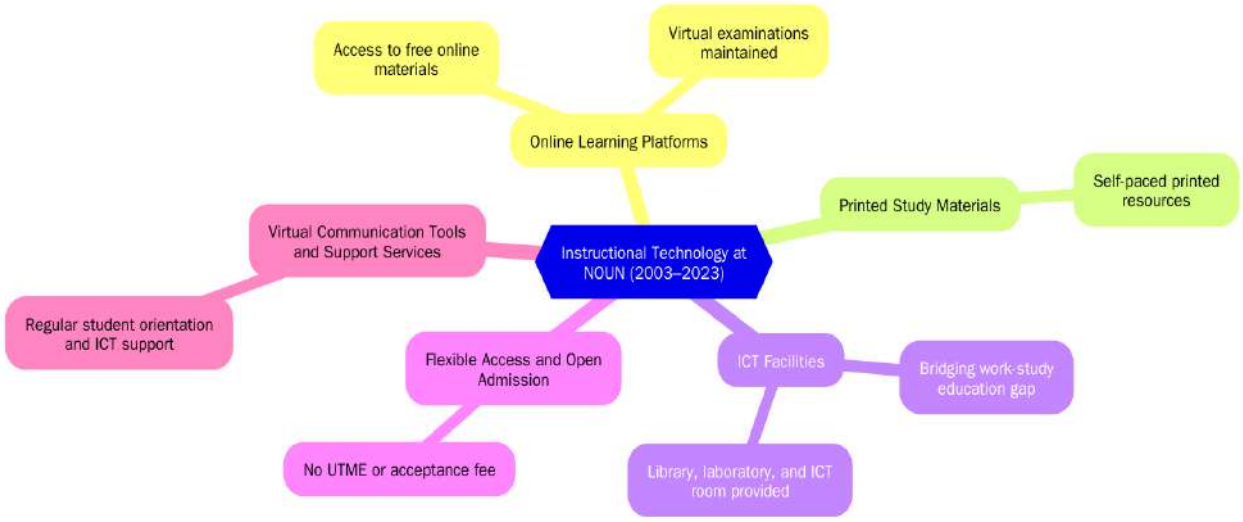
Thematic findings

In addition, to the survey findings, the assertions of Stakeholders of NOUN including coordinators, facilitators and administrators were analyse and five themes emerged as the modes of instructional technology and media available in the National Open University of Nigeria from 2003 to 2023



Source: Saidu & Saliu, (2025)

Figure 1: Thematic Map on Modes of Instructional Technology and Media (2003-2023)

Between 2003 and 2023, the National Open University of Nigeria (NOUN) adopted a variety of instructional technologies and media that fostered flexible and accessible education. A major ***Online Learning Platforms (figure 1)***, theme that emerged is the use of which enabled students to access educational resources remotely and at no cost. As highlighted by an administrator, *"It is not compulsory to come to school, there are materials online and it is free" (Excerpt 20),* affirming the shift to digital accessibility. Further emphasizing this transformation, a coordinator noted that *"virtual examinations were implemented and have remained a consistent feature of academic assessments" (Excerpt 21)*, demonstrating the institution's commitment to remote learning infrastructure.

Printed Study Materials (figure 1), In addition to digital platforms, NOUN maintained the use of which allowed learners to study independently and at their own pace. A facilitator acknowledged this flexibility, stating, *"You can learn at your own pace, unlike other universities" (Excerpt 21)*. This approach ensured inclusivity for students who may not have consistent internet access, aligning with the institution's mission of open and distance learning. The availability of ICT Facilities further supported the learning process. According to one administrator the university was specifically designed *"to bridge the gap between those who are working and need to be educated, to make learning easy for them" (Excerpt 30)* ICT infrastructure, including libraries, laboratories, and ICT rooms, were provided to support academic engagement, with students receiving regular orientation on examination procedures and ICT-related matters.

Flexible Access and Open Admission (figure 1), Another significant aspect which removed traditional entry barriers to tertiary education. A facilitator explained that *"There is nothing like UTME and Post UTME in NOUN. There is no acceptance fee"(Excerpt 20)*, underscoring the ***Virtual Communication Tools and Support Services*** university's inclusive admission policies. Also, the theme of reinforced NOUN's commitment to continuous student engagement and support. As one facilitator observed, *"regular orientations were conducted" (Excerpt 18)* to address academic and technical concerns, ensuring that learners remained guided throughout their educational journey.

In general, between 2003 and 2023, the National Open University of Nigeria (NOUN) embraced a range of instructional technologies and media that promoted flexible, inclusive, and accessible education. The institution transitioned from traditional print-based correspondence to integrating online learning platforms and multimedia resources, allowing students to access materials remotely and study at their own pace. This digital shift was supported by virtual assessments and robust ICT infrastructure designed to accommodate diverse learners, including those balancing work and study. NOUN's open admission policies further removed barriers to higher education, while continuous student support through orientations and

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virtual communication ensured sustained engagement. Together, these approaches reflect NOUN's commitment to evolving distance education that meets the needs of its learners across the country.

Research Question 2: What types of media technology were available in NOUN within the period 2003 to 2023?

Survey Findings

Selected items from the administered survey were analysed. These items focused on the evolution of instructional models, current delivery strategies, and compliance with national policy on instructional technology use. Responses from students and staff were scored and analysed using mean rank order to determine the extent of adoption and usage of each instructional mode. Table 1 below presents the ranked results, reflecting the most to least prevalent instructional technologies and media employed by NOUN over the two-decade period

Table 1: Mean Rank Order of Instructional Technology and Media Modes that were available in NOUN (2003–2023)

Instructional Technology/Media Mode	Mean Score	Rank
Online study materials	0.93	1
Multimedia/Integrated Model (print, audio, video, computer-based learning)	0.91	2
Distribution of printed study materials	0.90	3
Flexible Learning Model (Internet-based, IMM, computer-mediated communication)	0.86	4
Face-to-face interaction	0.86	5
Weekend seminars	0.84	6
Tele-learning Model (audio/video conferencing, radio)	0.82	7
Computer-mediated learning in study centres	0.80	8
Use of audio tapes, video tapes, CD-ROMs	0.78	9
Intelligible Flexible Learning Model (interactive, campus portal, WWW)	0.79	10
Induction approach	0.73	11
Period of practical field work	0.71	12
Correspondence Model (postal, print, journals)	0.75	13

Table 1 revealed a clear progression in the instructional technology and media employed by the National Open University of Nigeria (NOUN) from 2003 to 2023. The most widely adopted mode was online study materials, with a mean score of 0.93, followed closely by multimedia/integrated models (mean = 0.91) and distribution of printed study materials (mean = 0.90), indicating a strong shift toward digital and blended learning environments. While earlier methods such as the correspondence model (mean = 0.75) and the use of audio/video tapes and CD-ROMs (mean = 0.78) were still in use during the early years, they have gradually been replaced by more flexible and interactive technologies such as internet-based learning platforms and computer-mediated instruction (mean = 0.80). The continued use of face-to-face interaction (mean = 0.86) and weekend seminars (mean = 0.84) suggests that blended learning remained a key strategy to support student engagement. Overall, the data reflects NOUN's transition from traditional distance education methods to a more modern, technology-driven instructional model aligned with global trends in open and distance learning.

Discussion of the Findings

The study revealed that a clear progression in the instructional technology and media employed by NOUN, with online study materials being the most widely adopted mode, achieving a mean score of 0.93. This implies that instructional technology and media play a pivotal role in content delivery and learner engagement. This finding supports the assertion by Braimoh (2015), who highlighted that technology enables individuals to access education, information, and resources anytime and anywhere. In line with this, NOUN (2018) reported that the institution delivers education through various distance learning methods, including self-instructional materials, face-to-face facilitation, online tutorials, and radio/television broadcasts. The study provided that tutorial, prompt feedback and comments on assignments were the most significant aspects of student-support services of NOUN. These services include technical support, learning guides, academic mentoring, peer interaction, and access to learning resources, aimed at supporting a diverse learner population. This finding agrees with Jegede (2004), who noted that only 15% of qualified students gain admission into conventional universities in Nigeria, and viewed NOUN's existence as a means of extending educational opportunities nationwide. NOUN (2022) further corroborated this by reporting that the university's directorate offers guidance and counselling on academic programme selection, challenges of distance learning, social issues, and course or examination registration. Since study centres serve as the main points of interaction between the university and its students, most learner support services

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are provided at these centres. The study revealed that the most frequently reported issues were poor programe and policy implementations, inadequacy of media technologists for production and delivery of learning materials. NOUN (2013) similarly acknowledged that inadequate funding remains a major challenge confronting the university.

Conclusion

The National Open University of Nigeria has made significant strides in adopting and integrating instructional technology and media into its teaching framework. The dominance of online study materials, as indicated by the mean score of 0.93, underscores the university's commitment to digital transformation and flexible learning. However, while this progression is commendable, its effectiveness depends largely on the quality of digital content, students' technological readiness, and the institutional capacity to provide consistent technical support. Therefore, continued evaluation and refinement of these online systems are necessary to ensure they meet the diverse needs of learners across Nigeria.

Recommendations

Based on the finding, the following recommendations are proposed:

1. NOUN should invest more in improving internet accessibility and the stability of its online learning platforms to accommodate all learners, regardless of location.
2. Academic and technical staff should receive training in instructional technology design, multimedia content creation, and digital pedagogy.
3. The institution should regularly assess and update online materials to ensure relevance, interactivity, and alignment with current academic standards.
4. Strengthen digital literacy programmes and provide technical assistance to students struggling with online learning tools.

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Effects of Systematic Desensitization and Modelling Counselling Techniques on Social anxiety among Undergraduate National Certificate in Education Students in Kano State Nigeria

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Abstract

This study investigates the effects of Systematic Desensitisation and Modelling Counselling Techniques on social anxiety among students of NCE awarding Institutions in Kano State Nigeria. The objectives of the study are to find out the effects of Systematic Desensitisation and Modelling counselling techniques on the physiological, cognitive and behavoiural dimensions of social anxiety. Six null hypotheses were raised and tested at 0.05 level of significance. The study adopted a quasi-experimental design in the form of pretest and posttest design. The population consists of all NCE II students of Federal College of Education Kano and Federal College of Education (Technical) Bichi identified with social anxiety, there are 3,913 NCE 2 students in both schools out of which 196 students were identified with social anxiety. 60 students were sampled from the identified students who participated in the study. Two data collection instruments were used for the study; Validated Students Social Anxiety Checklist (SSAC) with reliability index of 0.861 was used for identification, while validated Social Anxiety Inventory (SAI) with reliability index of 0.936 was used for pretest and posttest. Paired sampled t-test was used to test the hypotheses at 0.05 level of significance. The result revealed that both Systematic Desensitisation and Modelling Counselling Techniques are effective in reducing social anxiety across the three dimensions. The study recommends that schools and counsellors should adopt both Counselling techniques in helping students manage social anxiety.

Keywords: Social Anxiety, Systematic Desensitisation, NCE awarding Institutions

Introduction

Anxiety has become one of the most common mental health issues faced by adults today. Several researches have been carried out in recent times on anxiety and its related field including social anxiety. Humans are social beings and often in emotional need for social communication and interactions, however, people who has social anxiety feel dread that does not match to the states that they confront. Factors such as lack of self-confidence, fear of rejection, criticism and past negative experiences cause people to feel anxious in social situations, this situation is referred to as social anxiety. During this time social anxiety is frequently related with mutism and these problems may lead to severe destruction in social, academic and occupational functioning. Social anxiety imposes negative effects on different aspects of an individual's life, including educational, social, family and interpersonal relationships (Ahmad, et al., 2017). This condition causes a persistent fear of social situations in which a person may be embarrassed when exposed to unfamiliar people or under observation of others. Therefore, people with social anxiety may avoid such situations or experience a lot of tension. It is a common type of anxiety whereby a person feels symptoms of anxiety or fear in situations where they may be scrutinised, evaluated, or judged by others, such as speaking in public, meeting new people, dating, being on a job interview, answering a question in class, or having to talk to a cashier in a store. Other situations may include doing everyday things such as eating or drinking in front of others or using a public restroom, also may cause anxiety or fear due to concerns about being humiliated, judged, and rejected (Kedia& Kumar, 2025) and this situation can lead to fear of social rejection, personal distress and impairment of interpersonal and occupational functioning. Adolescents around age 18–24 may be most at risk of being affected with social anxiety, this is because social anxiety is seen as a common phenomenon among teens and adolescents, usually the individual began experiencing some related symptoms when they were only around 13 years old (Aune, et al., 2022). People may experience more than one symptom of social anxiety at the same time. Many studies showed that

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symptoms often begin during childhood or adolescence and continue into adulthood. According to the World Health Organization (2001) social anxiety typically begins in children or adolescents and can be caused by a combination of factors such as genetics and negative experiences. An individual who as a child experienced bullying, teasing, rejection, ridicule or humiliation is most likely to develop social anxiety in the future life situtions. However, an individual can develop social anxiety through the gene, therefore, shy children are also likely to become socially anxious adults as well as children with over-bearing parents. Common social situations include starting and maintaining conversations, playing and cooperating with others, expressing affection, and negotiating solutions to problems among others while common performance situations are presentations, tests, recitals, games, athletic demonstrations and so on.

The physiological components are the physical symptoms such as increased heart rate, trembling, and blushing among others. The cognitive components include negative thoughts and beliefs about one and social situations. The behavioural components are the avoidance of social situations and safety behaviours However in schools social anxiety is a situation of concern because socializing is a determinant of interaction with others within the school environment. Observation by the researcher has shown that students with this challenge cannot effectively interact with others and cannot express themselves in the classroom, they find it difficult to ask or answer questions in the classroom even when they know the answers, they sometimes do not concentrate in school, they are more comfortable in isolation, they are easily frustrated and most times tend to withdraw from their fellow students as well as their teachers. However, a sustained social anxiety without prior identification and treatment may lead to poor quality of life in future as the condition can prevent individuals to maximise opportunities that can enhance their careers particularly students of National Certificate in Education (NCE) awarding institutions who are being trained to become future teachers, hence the need for counselling. However, in order to address the challenges of social anxiety among the students of NCE awarding institutions in Kano State, this study has adopted two counselling techniques; Systematic Desensitisation and Modelling counselling techniques. Systematic Desensitisation counselling technique is a counselling technique intervention used to treat anxieties and disorders such as obsessive-compulsive disorder (OCD), and post-traumatic stress disorder (PTSD). It is predicated on the idea that the client has learned a conditioned aversive response (usually fear or disgust) to a specific stimulus and that this association can be treated by counter-conditioning (Impey, et al., 2020). Systematic desensitization uses counter-conditioning to teach a client a new response to the stimulus using relaxation techniques during graded exposure to the stimulus. In this way, the original fight-or-flight response of the sympathetic nervous system is replaced by the relaxation response of the parasympathetic nervous system (Thomas et al, 2017). The technique is called Systematic Desensitisation, as the counter-conditioning graded exposure proceeds systematically through three phases. First, the client learns relaxation techniques that will counter-condition their response to the aversive stimulus. Then the counsellor and the client collaborate to produce a hierarchy of the client's intensity of response to the stimulus at different levels of exposure to the stimulus. Lastly, the client is desensitised to the stimulus through systematically graded exposure to the stimulus and practices relaxation techniques to counter their aversive fight-or-flight response during the exposure. These three phases are practiced over several sessions and homework may also be given to maintain the counter conditioning between sessions. Several research studies have demonstrated the efficacy of Systematic Desensitisation counselling technique in the treatment of anxieties; however, there is a paucity of information on its efficacy in treating social anxiety.

The second Counselling Technique to be examined in this study is the Modelling counselling technique. The most significant problem of people with social anxiety is fear of social interactions, Modelling is a term which is also called observational Learning or imitation. It is a behaviorally based procedure that involves the use of live or Symbolic models to demonstrate a particular behaviour, thought, or attitude that a client may want to acquire or change (Eagly, 2013). Modelling Counselling technique is a counselling intervention in which an observer views a model engaged in adaptive behaviour. This technique is aimed at helping people to participate and learn adaptive behavior and also to reproduce more frequently and appropriately. It is a counselling technique in which a teacher the counsellor or the model performs an activity that the student or client has previously found difficult to perform and encourages it to be copied (Bandura, 1969). Most human behaviours are learned observationally through the process of Modelling. In Modelling, one person, while observing another person's behaviour, forms an idea of how the particular behaviour is performed, codes the information in his or her memory and later uses this coded information as a guide in his or her attempt to perform the behaviour like

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the observed model. This phenomenon involves four element processes according to Bandura (1969). This includes Attention, Retention, Motor Reproduction and motivational processes. The main goal of the technique is to allow an individual to learn new information and behaviour by watching other people, which is known as observational learning or Modelling.

Statement of the Problem

Students of NCE awarding institutions in Kano State are faced with issues of social anxiety for one reason or another and such students usually experience academic challenges such as the inability to ask or answer questions during lectures even when they know the answers, fear of making presentations in an academic environment and most especially during the teaching practice exercise which eventually will be their primary assignment as trained teachers. These challenges can cause students to avoid participating in academic activities or general teaching and learning activities in school especially ones that involve interactions. This may lead such students into depression which is likely to lead to other behavioural disorders. Consequently, these institutions are likely to produce incompetent teachers as the condition may prevent them from carrying out their duties effectively as teachers when they eventually become one. Social anxiety among students of NCE awarding institutions is highly prevalent as studies have shown that many adults experience social anxiety, particularly most of them are afraid of speaking in the public which is the most common fear factor in social anxiety. In colleges of education, this calls for a great concern because a student-teacher is expected to interact with other students and also participate in academic activities more than before. Despite researches carried out and measures provided through the curriculum in order to overcome this problem, the situation remained persistent, majority of subjects that include presentations, debates, including the teaching practice exercise that were introduced in the curriculum in order to enhance students' competence and confidence are not strictly adhered to in schools; most students will shy away from these activities while some of the tutors remain indifferent. Lastly is the non functionality of guidance and counselling services in schools today; they are either available but under utilised by students or not available at all; the availability of counselling services would help in early detection and intervention for such problems. To fill this void, this research examines the effects of systematic desensitization and Modelling counselling techniques on social anxiety among students of NCE awarding institutions in Kano State. Social anxiety among students can be treated with systematic desensitization and Modelling counselling techniques by identifying and addressing the causes behind the anxiety with the help of a professional counsellor. The systematic desensitization technique desensitizes the triggers that cause an individual to become anxious while the Modelling counselling technique employs the use of a model to demonstrate target behaviour to effect change in an unwanted behaviour through observation.

Objectives of the Problem

The objectives of this study are to determine:

1. The effect of Systematic Desensitisation counselling technique on physiological, cognitive and behavioural dimensions of Social Anxiety among students of NCE awarding institutions in Kano State, Nigeria.
2. The effect of Modelling counselling technique on physiological, cognitive and behavioural dimensions of Social Anxiety among students of NCE awarding institutions in Kano State, Nigeria.

Research Hypotheses

The following hypotheses were raised and tested in the research:

1. There is no significant effect of Systematic Desensitisation counselling technique on the physiological dimension of Social Anxiety among students of NCE awarding institutions in Kano State.
2. There is no significant effect of Systematic Desensitisation counselling technique on the cognitive dimension of Social Anxiety among students of NCE awarding institutions in Kano State.
3. There is no significant effect of Systematic Desensitisation counselling technique on the behavioural dimension of Social Anxiety among students of NCE awarding institutions in Kano State.
4. There is no significant effect of Modelling counselling technique on the physiological dimension of Social Anxiety among students of NCE awarding institutions in Kano State.
5. There is no significant effect of Modelling counselling technique on the cognitive dimension of social anxiety among students of NCE awarding institutions in Kano State.

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6. There is no significant effect of Modelling counselling technique on the behavioural dimension of Social Anxiety among students of NCE awarding institutions in Kano State.

Methodology

The study adopted a Quasi-Experimental design in form of Pre-test-Post-test only to examine the effects of Systematic Desensitisation and Modelling counselling techniques on social anxiety among students of NCE awarding institutions in Kano State, Nigeria. The population consists ofall students of Federal College of Education, Kano and Federal College of Education (Technincal) Bichi identified withsocial anxiety using the adapted Students' Social Anxiety Checklist (SSAC)and the Social Anxiety Inventory (SAI) was used for pretest and posttest to measure physiological, cognitive, and behavoiural dimensions of social anxiety. 60 students were sampled from the identified students to participate in the study. The instruments were validated and reliability was ascertained through pilot testing, with reliability index of 0.861 for adapted SSAC and 0.936 for SAI. Data collection involved administering the adapted SSAC in order to identify students with social anxiety, then, administering the SAI during pretest, 10 weeks of Systematic Desensitisation counselling techniques intervention, then administering the SAI after treatment for posttest. The data analyses employed were paired sample t-test to test the hypotheses at 0.05 level of significance.

Presentation of Results

The null hypotheses formulated to guide the study were tested below in tabular form at 0.05 level of significance:

H_{o1}: There is no significant effect of Systematic Desensitisation counselling technique on the physiological dimension of Social Anxiety among students of NCE awarding institutions in Kano State

Table 1: Paired t-test for pre-test and post-test physiological dimension of social anxiety mean scores.

Variables	N	Mean	S.D	t-cal	Df	P-Value (2-tailed)
Pre-test SD. Phy	30	25.53	1.22	25.189	29	.000
Post-test SD. phy	30	17.93	1.59			

Source: *Field Data, 2025*

Table 1 above shows the analysis for pre-test and post-test of physiological dimension of social anxiety mean scores of NCE awarding institutions students exposed to Systematic Desensitisation Counselling Technique treatment. The analysis shows that the t value is 25.189 with 29 as degree of freedom, P-value is 0.000 at 0.05 level of significance, and this indicates that the P-value is less than the level of significance. This shows that, the null hypothesis which states that there is no significant effect of Systematic Desensitisation Counselling Technique on physiological dimension of social anxiety among Students of NCE awarding institutions in Kano State is rejected and maintained that, there is significant effect of Systematic Desensitisation Counselling Technique on physiological dimension of social anxiety among students of NCE awarding institutions in Kano State.

Ho_2: There is no significant effect of Systematic Desensitisation counselling technique on the cognitive dimension of Social Anxiety among students of NCE awarding institutions in Kano State.

Table 2: paired t-test for pre-test and post-test cognitive dimension of social anxiety mean scores

Variables	N	Mean	S.D	t-cal	df	P-Value (2-tailed)
Pre-test SD.Cog	30	31.20	1.93	20.013	29	.000

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Post-test SD.Cog	30	21.33	1.72

Source: *Field Data, 2025*

Table 2 above shows the analysis for pre-test and post-test of cognitive dimension of social anxiety mean of NCE awarding institutions' students exposed to Systematic Desensitisation Counselling Technique treatment. The analysis shows that the t value is 20.013 with 29 as degree of freedom, P-value is 0.000 at 0.05 level of significance, and this revealed that the P-value is less than the level of significance. Therefore, the null hypothesis which states that there is no significant effect of Systematic Desensitisation Counselling Technique on the cognitive dimension of social anxiety among Students of NCE awarding institutions in Kano State is rejected and maintained that, there is significant effect of Systematic Desensitisation Counselling Technique on cognitive dimension of social anxiety among students of NCE awarding institutions in Kano State.

Ho$_3$: There is no significant effect of Systematic Desensitisation counselling technique on the behavioural dimension of Social Anxiety among students of NCE awarding institutions in Kano State.

Table 3 paired t-test for pre-test and post-test behavioural dimension of social anxiety mean scores

Variables	N	Mean	S.D	t-cal	df	P-Value (2-tailed)
Pre-test SD.Behav	30	31.13	2.02	19.644	29	.000
Post-test SD.Behav	30	21.46	1.43			

Source: *Field Data, 2025*

Table 3 above shows the analysis for pre-test and post-test of behavioural dimension of social anxiety mean scores of students of NCE awarding institutions exposed to Systematic Desensitisation Counselling Technique treatment. The analysis shows that the t value is 19.644 with 29 as degree of freedom, P-value is 0.000 at 0.05 level of significance, and this revealed that the P-value is less than the level of significance. Therefore, the null hypothesis which states that there is no significant effect of Systematic Desensitisation Counselling Technique on the behavioural dimension of social anxiety among Students of NCE awarding institutions in Kano State is rejected and maintained that, there is significant effect of Systematic Desensitisation Counselling Technique on behavioural dimension of social anxiety among students of NCE awarding institutions in Kano State.

Ho$_4$: There is no significant effect of Modelling counselling technique on the physiological dimension of Social Anxiety among students of NCE awarding institutions in Kano State.

Table 4: paired t-test for pre-test and post-test of physiological dimension of social anxiety mean scores

Variables	N	Mean	S.D	t-cal	df	P-Value (2-tailed)
Pre-test MOD Phy	30	29.93	1.01	20.429	29	.000
PosttestMODPhy	30	19.66	1.21			

Source: *Field Data, 2025*

Table 4 above shows the analysis for pre-test and post-test of physiological dimension of social anxiety mean scores of students of NCE awarding institutions exposed to Modelling Counselling Technique treatment. The analysis shows that the t value is 20.429 with 29 as degree of freedom, P-value is 0.000 at 0.05 level of significance, the P-value is less than

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the level of significance. Therefore, the null hypothesis which states that there is no significant effect of Modelling Counselling Technique on the cognitive dimension of social anxiety among Students of NCE awarding institutions in Kano State is rejected and maintained that, there is significant effect of Modelling Counselling Technique on physiological dimension of social anxiety among students of NCE awarding institutions in Kano State.

HO_5 There is no significant effect of systematic Modelling counselling technique on the cognitive dimension of social anxiety among students of NCE awarding institutions in Kano State.

Table 5: Paired t-test analysis for pre-test and post-test of cognitive dimension of social anxiety mean scores

Variables	N	Mean	S.D	t-cal	df	P-Value (2-tailed)
Pre-test MOD Cog	30	32.13	2.82	24.744	29	.000
Posttest MOD Cog	30	20.53	1.33			

Source: *Field Data, 2025*

Table 5 above shows the analysis for pre-test and post-test of cognitive dimension of social anxiety mean scores of students of NCE awarding institutions exposed to Modelling Counselling Technique treatment. The analysis shows that the t value is 24.744 with 29 as degree of freedom; the P-value is 0.000 at 0.05 level of significance, the P- value therefore less is than the level of significance. The null hypothesis which states that there is no significant effect of Modelling Counselling Technique on the cognitive dimension of social anxiety among Students of NCE awarding institutions in Kano State is rejected and maintained that, there is significant effect of Modelling Counselling Technique on cognitive dimension of social anxiety among students of NCE awarding institutions in Kano State.

HO_6 There is no significant effect of Modelling counselling technique on the behavioural dimension of Social Anxiety among students of NCE awarding institutions in Kano State

Table 6: Paired t-test analysis for pre-test and post-test of behavioural dimension of social anxiety mean scores

Variables	N	Mean	S.D	t-cal	df	P-Value (2-tailed)
Pre-test MOD Beh	30	31.73	2.71	19.395	29	.000
Posttest MOD beh	30	20.13	1.47			

Source: *Field Data, 2025*

Table 6 above shows the analysis for pre-test and post-test of behavioural dimension of social anxiety mean scores of students of NCE awarding institutions exposed to Modelling Counselling Technique treatment. The analysis shows that the t value is 19. 395 with 29 as degree of freedom, P-value is 0.000 at 0.05 level of significance, the P-value is less than the level of significance. Therefore, the null hypothesis which states that there is no significant effect of Modelling Counselling Technique on the behavioural dimension of social anxiety among Students of NCE awarding institutions in Kano State is rejected and maintained that, there is significant effect of Modelling Counselling Technique on behavioural dimension of social anxiety among students of NCE awarding institutions in Kano State.

Summary of Findings

The major findings of this study are as follows:

1. There is significant effect of Systematic Desensitisation and Modelling counselling techniques on physiological, cognitive and behavioural dimensions of social anxiety among students of NCE awarding institutions in Kano State.
2. There is significant effect of Systematic Desensitisation and Modelling counselling techniques on physiological, cognitive and behavioural dimensions of social anxiety among students of NCE awarding institutions in Kano State.

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3. There is nodifferential effect of Systematic Desensitisation and Modelling counselling techniques on behavioural dimensions of social anxiety among students of NCE awarding institutions in Kano State.

Discussion of Findings

This study was designed to determine the effects of Systematic Desensitisation and Modelling Counselling Techniques on the three Dimensions of Social Anxiety and equally to determine the differential effects of both techniques in dealing with overall Social Anxiety. The first finding of this study revealed that there is significant effect of Systematic Desensitisation on physiological dimension of social anxiety among students of NCE awarding institutions in Kano State. The mean scores decreased from 25.53 before the treatment to 17.93 after the treatment, indicating a substantial reduction of 7.6. This effect was statistically significant (p=.000), leading to rejection of the hypothesis. This significant reduction in the physiological dimension of social anxiety after systematic desensitization treatment aligns with Madoni et al,. (2018), who examined the effectiveness of group counselling, Systematic Desensitisation technique and emotional freedom technique in reducing students' public speaking anxiety. The result showed that the group counselling with Systematic Desensitisation technique and emotional freedom technique (EFT) were all effective in reducing the public speaking anxiety of students. Similarly, Adin et al., (2017) conducted a study on the effect of Speech Training with Systematic Desnsitisation on Enhancing Students' Speaking Competence and found that the mean score of Speech Training with Systematic Desnsitisation Technique was 67.36 for pretest and 79.80 for posttest. This indicated that the students' speaking competence got improved because the increase of Desensitisation Technique increases the students' speaking competence. This aligns with physiological dimension of social anxiety, as the students' increased in their speaking competence, the physiological dimension of social anxiety decreases.

The second finding revealed that there is significant effect of Systematic Desensitisation on cognitive dimension of social anxiety among students of NCE awarding institutions in Kano State. The mean scores decreased from 31.20 before the treatment to 21.33 after the treatment, indicating a substantial reduction of 9.8. This effect was statistically significant (p =.000) leading to rejection of the hypothesis. This significant reduction in the cognitive dimension after Systematic Desensitisation is in agreement with the study conducted by Obi and Oguzie, (2019), who conducted a study on the effect of Systematic Desnsitisation Technique on generalized anxiety among secondary school adolescents in Enugu East Local Government of Enugu state and found that Systematic Desnsitisation was very effective in reducing generalized anxiety of secondary school adolescents. This finding is similar to cognitive dimension of social anxiety as they both involve catastrophic thinking (imagining worst case scenario). Furthermore, the finding of this study concurred with Caparons et al., (2008), who conducted a study applying Systematic Desensitization in the treatment of fear of flying aid and concluded that the technique is effective on reducing fear of flying. This finding supports the cognitive dimension of social anxiety because it is an excessive fear, worry and also could reinforce and maintain fear.

The third finding of this study revealed that there is significant effect of Systematic Desensitisation on behavioural dimension of social anxiety among students of NCE awarding institutions in Kano State. The mean scores decreased from 31.13 before the treatment to 21.46 after the treatment, indicating a substantial reduction of 9.67 this effect was statistically significant (p =.000) leading to rejection of the hypothesis. This significant reduction in the behavoiural dimension of social anxiety after Systematic Desensitisation treatment aligns with Umar et al,. (2023) who conducted a study on the assessment of Systematic Desensitisation counselling technique on social Phobia among Nigerian undergraduate students and suggested that counsellors and teachers should be encouraged to use Systematic Desensitisation counselling Technique in addressing social phobia behaviour among Nigerian undergraduate students. Also, a study aimed to find out the effectiveness of Rational Emotive Behavior counseling with systematic desnsitisation technique in reducing 8th-grade students' anxiety test in SMPN 3 Ungaran by Sulistiyoningrum and Mulawarman (2019) has shown that the use of both techniques has effectively reduced students' anxiety during tests. Students usually demonstrate test anxiety behaviour whenever they are to sit for tests, therefore making the findings of Sulistiyoningrum and Mulawarman support the behavioural dimension of the present study.

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The fourth finding of this study revealed that there is significant effect of Modelling counselling technique on physiological dimension of social anxiety among students of NCE awarding institutions in Kano State. The mean score result shows decrease from 25.93 prior to the intervention to 19.66, with a mean difference of 6.27. The result indicates a significant reduction in the physiological dimension of social anxiety. This effect is statistically significant (p =.000 leading to rejection of the hypothesis. The finding is relevant to the study of Ukamaka and Fidelis (2013) who conducted a study on the Effect of Modelling counselling technique on social anxiety among students of Imo State College of Education Uboma and the finding revealed that Modelling was effective on social anxiety reduction and improvement in the students' interaction, results also showed that a cognitive factor contributes more in social anxiety than physiological factors. The finding is also in line with another research conducted by Maduka, (2019) on the effects of Modelling and Self Instruction Technique on social anxiety among secondary school adolescents in Enugu East Local Government of Enugu State, the result revealed that Modelling was effective in reducing the social anxiety of secondary school adolescent students irrespective of the dimensions of social anxiety as the interaction of the students increased after the treatment.

The fifth finding of this study revealed that there is significant effect of Modelling counselling technique on cognitive dimension of social anxiety among students of NCE awarding institutions in Kano State. The mean score result shows decrease from 32.13 prior to the intervention to 20.53, with a mean difference of 11.6, this result indicates a significant reduction in the cognitive dimension of social anxiety. This effect is statistically significant (p =.000 leading to rejection of the hypothesis. However, this finding is in agreement with Bisri et al (2018) on the effectiveness of group counselling with Modelling Counselling Technique to improve Self-Efficacy in Senior High School Students Decision making in Continuation and the result revealed that students decision making was improved after the group counselling with Modelling counseliing technique. Also, Hukulati et al (2022) investigated the effectiveness of group counselling with live modeling techniques to improve academic self-efficacy of guidance and counseling students where the result revealed that the live modeling technique in group counseling was effective in increasing the academic self-efficacy of the Guidance and Counseling students. These findings are in line with the cognitive dimension of social anxiety because self-efficacy is the belief in one's ability to accomplish certain task including self- confidence.

The sixth finding of this study revealed that there is significant effect of Modelling counselling technique on behavioural dimension of social anxiety among students of NCE awarding institutions in Kano State. The mean scores decreased from 31.73 to 20.13, the mean difference is 11.6 after the treatment which indicates a substantial reduction in the behvioural dimension of social anxiety. This effect is statistically significant (p=.000), leading to rejection of the hypothesis. This significant reduction in the behavoiural dimension of social anxiety after Modelling treatment aligns with the finding of Nnodum (2010) who conducted an investigation on the Relative Effectiveness of Assertive Training (AT), Modelling (M) and a combination of Assertive Training and Modelling (AT&M) techniques in improving the social skills of primary school isolates and found out that the techniques were effective by improving the social skills and reducing isolate behaviour of the primary school students. The finding is also in agreement with Eghe and Nwanko (2019) in investigating the effects of Modelling technique on shyness among junior secondary school students in Benin Metropolis of Edo State, the finding revealed that Modelling technique was effective in reducing shyness among junior secondary school students. Also, Siyasiya et al (2022) revealed in the effect of Modelling counselling technique on shy behaviour among senior secondary school students in Gwale Zonal Education Directorate of Kano State that Modelling counselling technique is effective in changing shy behaviour among secondary school students. Lastly, the finding is in agreement with the study carried out by Nnadi et al,. (2019) who examined the effect of Modelling technique on impulsivity among junior secondary school students in Anambra state. The results obtained from the study showed that Modelling technique was significantly effective in reducing impulsivity among the junior secondary school students who participated in the experiment. Impulsivity denotes tendency to act without thinking.

Conclusion

Based on the outcomes of this study, the following conclusions were drawn:

1. Systematic desensitistion counselling technique is significantly effective in reducing physiological, cognitive and behavioural dimensions of social anxiety.

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2. Modelling counselling technique is significantly effective in reducing physiological, cognitive and behavioural dimensions of social anxiety.

Recommendations

Based on the findings of this study, the following recommendations were made:

1. The finding of this study revealed that systematic desensitisation counselling technique is significantly effective in the treatment of the physiological dimension of social anxiety, schools and school counsellors should include the technique into counselling programs to help students overcome physiological challenges of social anxiety.
2. Findings from this study also revealed that systematic desensitisation counselling technique is significantly effective in the treatment of the cognitive dimension of social anxiety, counsellors should therefore use systematic desensitisation to address illogical thinking associated with the challenges of cognition in students such as low self-esteem and feeling of unworthiness by including sessions that will boost emotional confidence of the students.
3. Since the finding of this study discovered that Systematic Desensitisation Counselling Technique is significantly effective in dealing with the behavioural dimension of social anxiety, institutions should organize workshops to encourage counsellors to use this technique during counselling sessions on social anxiety, by this, counsellors would be able to assist students to overcome avoidant and safety behaviours as a result of social anxiety.
4. Since the finding from this study revealed that modelling counselling technique is significantly effective in the treatment of the physiological dimension of social anxiety, schools should organise modelling related programs from time to time in order to help students model acceptable social behaviours by mentors such as maintaining self confidence in social situations.
5. Finding from this study showed that modelling counselling technique is significantly effective in the treatment of the cognitive dimension of social anxiety, counsellors should be trained to provide emotional support and encouragement to students, helping them build confidence in themselves and encourage them to practice as such.
6. Finding from this study showed that modelling counselling technique is significantly effective in the treatment of the behavioural dimension of social anxiety, counsellors should be trained by the government to provide support and encouragement to students, by organizing programs such as presentations, debates, quiz competitions as well as emphasizing on the importance of feeling confident in oneself, this will help to improve better and reduce the behavioural challenges of social anxiety.

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Qualitative Study on Leveraging McGregor's Theory in Managing Co-Curricular Activities at Secondary School Level of Education in Nigerian

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Abstract
In today's rapidly evolving world, students are expected to excel not only in academics but also in a broad range of life skills that prepare them for real-world challenges. Therefore, t*his paper examines the application of McGregor's Theories X and Y in the implementation of Co-curricular activities in schools. The primary aim was to align the roles of teachers and co-curricular coordinators with contemporary management principles that enhance student engagement and participation. The study critically explored the core assumptions of both theories, highlighting their relevance to educational leadership. Theory X, which assumes that individuals inherently dislike work and require external control, is contrasted with Theory Y, which posits that individuals are self-motivated and thrive under supportive, participatory leadership. These theoretical orientations were analyzed about how co-curricular activities are planned, implemented, and supervised in school environments. The study revealed that the participatory and motivational qualities of Theory Y closely align with the objectives of co-curricular activities, which demand creativity, initiative, collaboration, and student-centered engagement. Consequently, the paper concluded that for optimal outcomes in student development and holistic education, school leaders and activity coordinators should adopt the flexible, empowering strategies of Theory Y, while selectively drawing on Theory X in situations that require structure and discipline.*
Key words: Co-Curricular Activities, McGregor's theory

Introduction
Education is fundamental for manpower and national development. Thus, the Federal Republic of Nigeria, through the National Policy on Education, adopts education as a vital instrument for individual development and integration into a functional society. In addition, education fosters the worth and development of individuals, and for their sake and the general development of society. The purpose of education is to prepare students for the culture of society. UNESCO (2015) stated that education is a lifelong process aimed at man power development, intellectually, morally, socially, and emotionally developing individuals. Musakanya and Chanda (2024) affirm that the true essence of education lies in its ability to prepare students for life, not just examinations. The 21st century poses complex challenges for education, requiring a shift in focus from simply preparing students to develop adapt, creative, and critical-thinking individuals who can drive innovation and societal progress. Most tradition and nearly all contemporary educators acknowledge that education involves more than merely helping pupils memorize facts, numbers, and skills. Schools serve as institutions where specialized training is systematically delivered in subject areas that individuals may not readily acquire through everyday life experiences. In many educational systems, school activities are broadly categorized into curricular and co-curricular components. Curriculum can be defined as the document, plan, or blueprint for instructional guidance that is used for teaching and learning to bring about positive and desirable learner behaviour change (Offorma, 2014). This definition refers to the formal curriculum, which is planned ahead of time, bearing in mind the characteristics of the curriculum recipients, the philosophy and goals of education (reflecting the culture of the people), the environment, the resources, methods of teaching, and evaluation procedures. It is the road map to the attainment of the goals of education. It also focused on structured academic instruction. While the latter serves as a platform for non-academic learning. Thus, it is believed that co-curricular activities are a crucial component of the educational process. In the formal school system, co-curricular activities are carried out at the basic, post-basic, and tertiary institution levels.

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Chalageri and Yarriswami (2018) described co-curricular activities as activities designed to occur outside regular classroom settings to boost students' overall development. It plays a significant role in reinforcing and enriching the academic curriculum. Dastyar (2018) asserted that co-curricular involvement enhances creativity and interpersonal relationships. Lim eta (2018) observed that participation in these activities contributes to emotional well-being and self-expression. According to Hinds (2014), unlike the academic curriculum, co-curricular activities focus on nurturing cooperation, responsibility, and leadership in a collaborative environment.

The National Policy on Education (2016) states that co-curricular activities are sports, clubs, and societies, which are important instruments for character training and should be positively encouraged. Students must join one club, a Game, and a society. In Nigeria, despite the policy direction, co-curricular activities have not been effective in supporting the formal curriculum that takes place in the school. The planning of co-curricular activities falls under the responsibility of the school's management. They must also advocate for the effective implementation of educational tasks and act as mentors (Primasatya & Imron, 2020). Similarly, educators in schools play crucial role in implementing co-curricular activities. Berhanu (2019) highlighted that in many African countries, the implementation of co-curricular activities is fraught with logistical and administrative hurdles. According to Batool and Raiz (2019), even when programmes are available, their implementation is often ad hoc and lacks strategic alignment with students' developmental needs. Gender, teacher qualification, school location, and school type are also critical factors affecting the success of co-curricular activities in different contexts (Ibrahim, 2016; Hill, 2015; Doyin, 2012). Teachers should be aware of their responsibilities in executing these activities. The global educational landscape is rapidly evolving, with an increasing emphasis on holistic human development. This dynamic necessitates a more strategic approach to co-curricular activities. Coordinators must move beyond traditional methods and effectively leverage both human and material resources, both within and outside the school environment, to achieve optimal student outcomes and to align the roles of teachers and co-curricular coordinators with contemporary management principles that enhance student involvement. The Theory X, which assumes individuals inherently dislike work and require external control, while Theory Y, which posits that individuals are self-motivated and thrive under supportive, participative leadership. To this end, the application of relevant management theories is crucial for the successful implementation and oversight of co-curricular programs in secondary schools.

The Emergence of Theory X and Theory Y

McGregor, a social psychologist, made significant contributions to management at the age of 58. He was the first to name concepts associated with him and sought to understand how human variables influenced organizational behavior and outcomes. His seminal thought continues to influence various management sectors today. McGregor's 'Conventional View' of management tasks, or Theory X, emphasizes the duty of management to organize, direct, control, and modify employee behavior to prevent passive resistance to work, a concept often taught in business schools.

The underpinnings of this view were, as argued by McGregor (1957), that people were averse to working, lacked ambition and a desire for responsibility, were selfish, resistant to change, and gullible. Therefore, the conventional wisdom was that people needed to be, indeed preferred to be, led by others. In response to these assumptions, management style then resulted in the 'hard' and 'soft' management approaches. The 'hard' approach was coercive, requiring close supervision and tight control, which often resulted in resistance and obstruction, and a 'soft' approach which was seen as resulting in the abdication of management and indifferent performance. The popular strategy then which was developed amongst managers, was "firm but fair (McGregor, 1957). In contrast to Theory X, or the conventional approach to management, McGregor (1957) proposed an alternative approach based on more adequate assumptions about human nature, which he called Theory Y. In this perspective, management's role is not simply direction, but in organising the resources for an enterprise to meet its objectives, whether they be human or material. People are not passive, and it is the responsibility of management to provide opportunities for the development of their employees, to release their potential by creating the conditions so that people can harness their efforts to achieve organisational objectives. The scientific movement, in an attempt to get the work done quickly and cheaply, means dehumanized the worker and encouraged mechanical behaviours. That is why the behaviour of the early co-curricular activities coordinators was autocratic and bossy. They could fire and discipline the students who engaged in the activities as they feel. The principle of theory X in human management follows these early scientific movements propounded by Fredrick Tylor.

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The human relations movement is a radical change from scientific management. Contributors like Mayo (1933, 1945), Follett (1940) are regarded as the father of the human relation movement. The movement is based on the building and maintenance of dynamic harmonious human relations. They came out with a lot of ideas about human responsibilities in the industry after the Elton Mayo famous studies at the Hawthorne Works of the Western Electric Company near Chicago, that both the psychological and sociological factors must be considered, so as to get huge productivity from the workers; such as morale, job satisfaction, team spirit and acceptance. They emphasized that organization is a complex social group and require expert handling to achieve it best desire. This principle is linked with theory Y.

The Basic Assumptions of Theory X

McGregory (1960), Ajayi and Ayodele (2002) attempted to provide a framework for proper management of organization goals, came out with the followings about man.; (i) An average individual is naturally lazy and thus has an inherent dislike for work and will avoid it, if possible; (ii) An average human being is dependent, unimaginative and shortsighted. He therefore must be controlled and directed to achieve organizational goals; (iii) An average human being is irresponsible; (iv) An average individual has fixed or set ways of doing things (v) An average individual is resistant or hostile to authority and leadership; (vi) An average human being wishes to avoid responsibilities, has little ambition but above all seeks security.

Based on these assumptions about workers; Waston (1966) suggested the following corresponding administrative policies using theory X; (i) That the people are lazy naturally and avoid work. Therefore, the administrator should drive and coerce them to work; (ii) That people are dependent, therefore the administrator should direct them (iii) That people are generally irresponsible, therefore the administrator should mount a control over them (iv) That people are short-sighted; therefore the administrator should plan for them (v) That people have fixed or set ways of doing things; therefore, the administrator should encourage routine procedures in work.

Theory X as Applied to Co-Curricular Activities

Theory X is in line with the formal propagators of co-curricular activities in Nigeria, put into practice as a relationship between the coordinators and students. This is usually referred to as the pedagogy.

In the pedagogical situation, the administrator, coordinator, or instructor is the king. He is bossy and autocratic, and he sees others as subordinates, who cannot think for themselves and are always trying to run from responsibilities, unless they are forced or coerced. The pedagogical coordinator in co-curricular activities is the one who knows what is best for the students, decides what to do, controls their relationship, directs the activities, sets standards of performance and test performance with outputs, and rewards the participants with materials.

The following are some of the assumptions of coordinators about co-curricular activities.

1. They cannot direct themselves unless they depend upon the coordinators.
2. That student has little experience and that the activities of co-curricular cannot be based on the experience of the students.
3. The needs of the co-curricular activities in schools should be established by the coordinator and the Ministry of Education because the students cannot diagnose their immediate needs.
4. The orientation of students in co-curricular activities have be geared for future purposes, that the students should master the activities, which needs to be put into used later.
5. That instructor or coordinator has to evaluate the students and award a reward at the end.

The application of theory X alone has not solved any co-curricular activities problems. It has, instead, led to the failure of the various co-curricular activities geared towards making the student all-round development. Unfortunately, co-curricular activities are out of reach for the vast majority of pupils. There are times when people are uninterested, when they are too busy, when they cannot afford to participate, when they live in a remote village, when they are denied a chance, and when they do not see any value in taking part (Castano & Kelly, 2012). Even those who engaged in co-curricular activities are often disengaged, because their immediate needs and interest are not considered. These have been the reason for the various philosophical principles which sought for radical change to the theory Y of McGregor.

Basic Assumptions of the Theory Y

McGregor (1960) basic assumptions in theory Y include the following:

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1. That man will exercise self-direction and self-control toward an organizational goal, if he is committed to them.
2. That the average person can learn to accept and seek responsibility.
3. That creativity, ingenuity, and imagination are wide spread among people and do not occur only in a selected few.
4. That commitment is a function of rewards. The best rewards are the satisfaction of ego and self-actualization.
5. That people are not lazy, but the environment makes them so; if the environments are conducive, that physical work and mental work are as natural as play.

Again Watson (1966) suggested the corresponding administrative policies about human behavior in organization, using theory Y:

1. That people are independent, therefore the administrator should allow them to direct themselves.
2. That people are naturally active and enterprising, therefore the administrator should provide good leadership and motivation.
3. That people can identify with you and have loyalty, therefore the manager gives the co-operation and support.
4. That people like to take up responsibility, therefore the manager should trust them.
5. Those workers are capable of broad vision and long view; therefore, the administrator should plan and take decision with them.

Theory Y as Applicable to Co-Curricular Activities

Based upon the theory Y, the following assumption was made

1. That student becomes more experienced over time. This accumulated experience made them qualitatively different from the others who are not engaged. The basic knowledge should be used in the implementation of Co-curricular activities.
2. That student, as learners, is self-directing; their orientation is towards self-direction. Therefore, the activities given to them are not to give new direction but to help them discover which way to go.
3. That the students have tasted freedom. They are relatively free from the infant. Therefore, students cannot be forced to do things.
4. That student are very much aware of the importance of time and therefore not interested in things that are either general or things of the future, but in a kind of co-curricular activities that will solve present problems.

It can then be asserted that theory Y recognize the students as human being and not as a tool or machine, that can be manipulated to achieve the co-curricular activities objectives.

Based on the forgoing theory X and theory Y in co-curricular activities to achieve its objectives.

1. That student who engaged in co-curricular activities are self-directive, that is, they are independent, people can take initiative on their own without being forced or coerced.
2. Students who participate in co-curricular activities are always ready to function; the degree of their readiness depends upon the task to be performed and the roles to play.
3. That the experiences of the students who are involved in co-curricular activities are a rich source of skill, knowledge, moral beliefs, and confidence.
4. That decision about the selection of co-curricular activities is based on collaborative efforts of both the coordinators and students.
5. The type of co-curricular activities and the objectives are clearly stated. This has led to an increase in students' involvement in co-curricular activities.

Conclusion

School administrators play a vital participatory role in the successful implementation of co-curricular activities. Their engagement goes beyond mere supervision; they actively consult with students, involve them in decision-making processes, and jointly determine the nature and direction of the activities to be undertaken. This inclusive approach not only fosters a sense of ownership among students but also promotes the development of self-direction and autonomy, which are essential attributes for lifelong learning and personal growth. Moreover, effective school administrators clearly define the objectives of co-curricular programs, establish measurable goals, monitor the performance of participants, and provide timely and constructive feedback. Such practices help in aligning the activities with educational outcomes and ensuring continuous improvement. Importantly, the most effective coordinators of co-curricular activities are those who adopt a flexible and pragmatic approach to leadership. They skillfully integrate elements from both directive and participatory theories,

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adapting their strategies to the specific challenges and needs that arise. By employing whichever approach is best suited to address immediate concerns whether it requires firm guidance or collaborative problem-solving these coordinators are able to maintain a balanced and responsive leadership style that enhances both student engagement and programmes success.

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Effects of Semantic-Mapping and Scrabble-Game Strategies on English Spellings and Pronunciations among Secondary School Students in Okene, Kogi State, Nigeria

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Abstract
Students' failure in external examinations has been attributed to their poor vocabulary base, exacerbated by teachers' poor instructional strategies. This study therefore, examined a comparative effect of semantic-mapping, scrabble-game and the combination of both semantic-mapping and scrabble-game on vocabulary achievement of secondary school students in Okene, Nigeria. The objectives were to find out: (i) the general achievement of secondary school students in English spelling and pronunciation in Okene, Nigeria; (ii) the effect of scrabble-game, semantic-mapping and combination of both on the achievement in spelling; (iii) the effect of scrabble-game, semantic-mapping and combination of both on the achievement in pronunciation in Okene, Nigeria. The study adopted a quasi-experimental design of pre-test, post-test and control group using four by two by two factorial design $(4x\ 2)$*, involving three experimental groups and one control group. Four public secondary schools and all the students in JSS II intact classes served as the sample for this study using stratified random sampling technique. An achievement test on vocabulary was adapted from the National Examinations Council and state examinations past questions as instrument for this study. Percentage, Mean and Standard Deviation and Analysis of Covariance (ANCOVA) were used to answer and test the research questions and hypotheses respectively. The findings of the study indicated the general achievements in vocabulary of the students to be low before the treatment (pre-test) but increased averagely after treatment (post-test). Significant effects existed among scrabble-game, semantic-mapping and combination of scrabble and semantic-mapping on students' achievement in spelling, but not favoring semantic mapping as a single technique; Scrabble-game, semantic-mapping and combination of both had effect on secondary school students' achievement in pronunciation, The study therefore, recommended that teachers should make use of the combination of Semantic-mapping and Scrabble-game strategy to facilitate effective English vocabulary learning.*
Key words: Achievement, Language Teaching, Scrabble-game Semantic-mapping, Vocabulary

Introduction
Vocabulary as the foundation on which communication is built could be considered very key to language learning without which it might be difficult to express ideas, emotions, or feelings appropriately, especially within and outside the classroom environment. Vocabulary is important to English Language learners (ELLs) because it forms the foundation of communication. Learners of English as a second language need a robust vocabulary to express their thoughts, ideas, and feelings effectively in English, both in oral and written. Insufficient vocabulary would make learners struggle to pass their messages across accurately and clearly (Nation, 2001). Vocabulary learning covers linguistic elements such as, spelling, pronunciation, morphological structure, lexico-syntax and lexico-semantic which all serve as the rubrics upon which vocabulary thrives. On the one hand, ability to spell enhances word recognition, recall and comprehension; on the other hand, good pronunciation aids in auditory recognition of vocabulary which enable learners to process spoken words effectively (Ehri, 2005; Darcy, 2018). Learners' vocabulary knowledge would become robust, enabling them to develop both receptive (listening/reading) and productive (speaking/writing) skills of English Language. Schmitt (2010) and Folse (2006) further asserted that the ability to comprehend spoken and written English depends heavily on vocabulary knowledge. Students need to understand vocabulary in context to comprehend conversations, lectures, readings, and instructions across different subjects and situations. This will impact their academic performance; proficiency in English vocabulary is closely connected to academic achievement (Adeniyi-Egbeola, 2006).

Basic education remains the foundation upon which learning opportunities for continuous education is laid. Students' poor performance at the basic level of education, especially in English language has led to public outcry among educators, thereby, making scholars redirect efforts towards identifying factors responsible for the students' performance trend and

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by paying attention to probable solutions. The importance of vocabulary in English language learning might have accounted for the special attention the Federal Government of Nigeria (FGN) paid to it by advancing the purpose of its inclusion in the National English curriculum. The curriculum spells out the objectives of learning vocabulary at the junior secondary level to cover effective use of vocabulary. The expectation is that at the completion of basic education, effective understanding and utilizing of the language skills would have been achieved. However, despite its importance, it cannot be said that secondary school students have good mastery of vocabulary. Lack of this knowledge might be responsible for students' poor performance in WASSCE over the years (WAEC, 2023). To achieve effective teaching and learning of English vocabulary, good teaching strategies should be adopted. If not, learning of vocabulary becomes less interesting to the students. There are a lot of strategies that teachers could be employed to teach vocabulary. These include contextual learning, repeated exposure, multisensory approach, word parts, meta-cognitive approach, semantic-mapping and scrabble-game among others. For instance, semantic-mapping is one of the strategies used by teachers of language to teach concepts through graphics representation. Khoii and Sharifafar (2013) stated that semantic–mapping is a visual strategy that enhances vocabulary development. Scrabble-game, on the other hand, is a game of word letter tiles used by the player to create words on a game board. Each of the players pulls tiles randomly from a pool and takes turns placing them on the board to form words. The tiles have different point values, and the aim is to maximize points by intentionally placing tiles on bonus squares and creating longer or higher-scoring words. The game typically consists of a 15x15 grid game board, but variations with different board sizes exist. Players can only create words that are valid based on an agreed dictionary, and they must connect their words to existing ones on the board. The game continues until all tiles have been drawn and one player uses up all their tiles or no more valid words can be formed (Klimova, 2015). Olajide, Adeniyi-Egbeola and Badru (2020) explained that there is no technique or strategy of teaching that is all-encompassing, and that all the different strategies have their advantages and disadvantages. Therefore, a blended strategy may be required in order to bring about effective teaching and learning, since the advantage of one strategy can be used to address the shortcomings of the other. How all these techniques influence Secondary School students' vocabulary achievement in Okene, Nigeria is of both social and academic importance

Purpose of the Study

The general purpose of this study is to find out the comparative effects of semantic-mapping, scrabble-game and the combination of both semantic-mapping and scrabble-game on English vocabulary achievement of secondary school students in Okene, Nigeria. Specifically, the research attempted to find out:

1. The general achievement of secondary school students in English vocabulary (spelling, pronunciation) in Okene, Nigeria;
2. The effect of scrabble-game, semantic-mapping and combination of scrabble-game and semantic-mapping on the achievement in spelling among secondary school students in Okene, Nigeria.
3. The effect of scrabble-game, semantic-mapping and combination of scrabble-game and semantic-mapping on the achievement in pronunciation among secondary school students in Okene, Nigeria.

Research Questions

1. What is the general achievement of secondary school students in English vocabulary (spelling, pronunciation in Okene, Nigeria?
2. What is the effect of scrabble-game, semantic-mapping and combination of scrabble-game and semantic-mapping on secondary school students' achievement in spelling in Okene, Nigeria?
3. What is the effect of scrabble-game, semantic-mapping and combination of scrabble-game and semantic-mapping on secondary school students' achievement in pronunciation in Okene, Nigeria?

Research Hypotheses

The following null hypotheses were formulated and tested in this study.

H_{01}: There will be no significant effect of scrabble-game, semantic-mapping and combination of scrabble-game and semantic-mapping on the achievement of secondary students' spelling in English in Okene, Nigeria.

H_{02}: There will be no significant effect of scrabble-game, semantic-mapping and combination of scrabble-game and semantic-mapping on the achievement of secondary school students' pronunciation in English in Okene, Nigeria.

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H_{03}: There is no significant interaction effect of scrabble-game, semantic-mapping, combination of scrabble-game and semantic-mapping and gender on secondary school students' English vocabulary (spelling, pronunciation, morphological structure, lexico-syntax and lexico-semantics) achievements in Okene, Nigeria.

Methodology

This study is an experimental design which aimed at examining the comparative effects of semantic-mapping, scrabble game and the combination of both semantic-mapping and scrabble game on English vocabulary achievement of secondary school students in Okene, Nigeria. The population for this study was all the Junior Secondary School Students in Okene, Nigeria. The target population for this study consisted of all the Junior Secondary Two (2) students (JSS II) in Okene, Nigeria. The study adopted a quasi-experimental design of pre-test, post-test and control group design using a four by two factorial design(4×2) involving three experimental groups and one control group. Stratified random sampling technique was used to select four public secondary schools in Okene, Nigeria. Also, all the students of one of the JSS II intact classes from the selected schools served as the sample for this study. An achievement test on vocabulary titled: Students Achievement Test in Vocabulary Development (SATVOD) was adapted from the National Examinations Council's and state examinations past questions as instrument for this study. The gathered data was graded using a prepared marking scheme. Percentage, Mean and Standard Deviation and Analysis of Covariance (ANCOVA) were used to answer and test the research questions and hypotheses respectively.

Descriptive Statistics

Table 1: Distribution of the Respondents According to Gender

Quasi-experimental Group	Gender		
	Male	Female	Total
Control Group	28 (52.8%)	25 (47.2%)	53 (100%)
Treatment Group I (Scrabble-Game)	15 (38.5%)	24 (61.5%)	39 (100%)
Treatment Group II (Semantic-Mapping)	24 (39.3%)	37 (60.7%)	61 (100%)
Treatment Group III (Scrabble-Game and Semantic-Mapping)	26 (43.3%)	34 (56.7%)	60 (100%)
Total	**93 (43.7%)**	**120 (56.3%)**	**213 (100)**

The table 1 above shows the frequency distribution of the participants based on gender.

Answering Research Questions

To answer all the research questions raised in this study, table 2 was used to draw inferences on students achievement in the test conducted.

Table 2: Inference for Students Achievement Levels

Achievement Levels	Scores Description
High	70 and above
Average	45 – 69
Low	0- 44

Research Question 1: *What is the general achievement of secondary school students in English vocabulary in Okene, Nigeria?*

Table 3: General Achievements in English Vocabulary by Secondary School Students in Okene, Nigeria

	Mean	Standard Deviation	Inference
Vocabulary (Pre-test)	37.80	9.87	Low
(Post Test)	58.18	15.08	Average

Table 3 above shows the means and standard deviations of the respondents' general achievement in vocabulary.

Research Question 2: *What is the achievement of secondary school students in spelling in English in Okene, Nigeria?*

Table 4: Achievements in English Spelling by Secondary School Students in Okene, Nigeria

Aspect of Vocabulary	Mean	Standard Deviation	Inference
Spelling (Pre-test)	56.62	21.63	Average
(Post-Test)	64.36	19.53	Average

Table 4 above shows the mean and standard deviation of the respondents' general achievement in English spellings. T

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Research Question 3: *What is the general achievement of secondary school students in pronunciation in English in Okene, Nigeria?*

Table 5: General Achievements in English Pronunciation by Secondary School Students in Okene, Nigeria

	Mean	Standard Deviation	Inference
Pronunciation(Pretest)	37.37	16.90	Low
(Post-test)	48.40	18.46	Average

Table 5 above shows the mean and standard deviations of the respondents' general achievement in English pronunciation.

Hypothesis Testing

A total of three null hypotheses were formulated and tested in this study using an Analysis of Covariance (ANCOVA) statistical test. The critical value (α) for acceptance/rejection of null hypothesis in this study was 0.05.

Hypothesis One: *There is no significant effect of scrabble-game, semantic-mapping and combination of scrabble-game and semantic-mapping on the achievement of the secondary school students in spelling.*

Table 6: Analysis of Covariance Showing the Difference in the Achievement Level of Secondary School Students Taught with Scrabble-Game, Semantic-Mapping and Combination of Scrabble-Game and Semantic-Mapping and those taught with the Conventional Method on Spelling.

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	4311.276	4	1077.819	2.929	.022
Intercept	103689.752	1	103689.752	281.824	.000
Pretest Spelling	.318	1	.318	.001	.977
Group	4246.030	3	1415.343	3.847	.010
Error	76528.161	208	367.924		
Total	963300.000	213			
Corrected Total	80839.374	212			

The table 6 above shows that there is a significant effect of scrabble-game, semantic-mapping and combination of scrabble-game and semantic-mapping on the achievement score of the participants in spelling because the p-value ($F_{3,212}$= 3.847, p-value = <0.05. Hypothesis one is therefore rejected. This implies that significant effects existed among scrabble game, semantic mapping and combination of scrabble-game and semantic-mapping on students' achievement in spelling. In order to ascertain the spread of effect, a post-hoc comparison of the post-treatment scores was carried out to identify the exact nature of the differences between the treatment groups and the results are presented in table 10 below.

Table 7: Post—hoc Analysis Showing the Post-test Mean Scores of the Quasi-experimental Groups in Spelling

		Subset for alpha = 0.05	
Group	N	1	2
Control group	53	60.1887	
Treatment group II (Semantic mapping)	61	60.3279	
Treatment group III (Combination)	60		68.0000
Treatment group I (Scrabble game)	39		70.7692

From the table 7 above, the mean scores of the participants in the scrabble group were significantly higher than the mean scores of the participants in the control group and semantic-mapping groups. However, it was not significantly different from the mean scores of the participants in the group with combination of both treatment one and two.

Hypothesis Two: *There will be no significant effect of scrabble-game, semantic-mapping and combination of scrabble-game and semantic-mapping on the achievement score of the participants in pronunciation.*

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Table 8: Analysis of Covariance Showing the Difference in the Achievement Level of Secondary School Students Taught with Scrabble-Game, Semantic-Mapping and Combination of Scrabble-Game and Semantic-Mapping and those taught with the Conventional Method on Pronunciation.

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	25537.674	4	6384.418	28.424	.000
Intercept	83112.662	1	83112.662	370.025	.000
Pre-test_Pronunciation	61.587	1	61.587	.274	.601
Group	25537.488	3	8512.496	37.898	.000
Error	46719.603	208	224.613		
Total	571300.000	213			
Corrected Total	72257.277	212			

The table 8 above shows that there is a significant effect of scrabble-game, semantic-mapping and combination of scrabble-game and semantic-mapping on the achievement score of the participants in pronunciation because the p-value is less than 0.05 ($F_{3,212}$= 37.898, p-value < 0.00). Hypothesis two is therefore rejected. This implies that scrabble-game, semantic-mapping and combination of both do have effect on secondary school students' achievement in pronunciation. In order to specify the aspects of the effects, a post-hoc comparison of the post-treatment scores was carried out and the results are presented in table 9 below.

Table 12: Post—hoc Analysis Showing the Post-test Mean Scores of the Quasi-experimental Groups in Pronunciation

Group	N	Subset for alpha = 0.05		
		1	2	3
Control group	53	35.811		
Treatment group II (Semantic-mapping)	61		40.000	
Treatment group I (Scrabble-game)	39		47.179	
Treatment group III (Combination)	60			65.333

From the table above, the mean scores of the participants in the control group were significantly lower than the mean scores of the participants in all of the treatment groups. However, the mean scores of the participants in the combination group was significantly the highest while the mean scores in the semantic-mapping and scrabble-game group did not significantly differ from each other. This implies that the combination of scrabble game and semantic-mapping have more significant effect on students' achievement in pronunciation than the two methods separately.

Discussion of Findings

General Achievement of Secondary School Students in English Vocabulary in Okene, Nigeria

The finding of this study indicated that the pretest results of students' achievement was low with 37.80% while the Post-test achievement was average with 48.18% which is still considered inappropriate for the knowledge of vocabulary generally, being a building block for language learning. However, the improvement recorded over the short period between the pretest and posttest proved that the teaching strategies would record higher impact if used continuously. At the spelling, pronunciation, the achievement was high with a mean score of 64.36%, 65.3%, respectively, favoring the combination of scrabble-game and semantic-mapping as the right teaching strategy. Semantic-mapping and the conventional strategies did not indicate significant effect as individual strategies. This implies that scrabble-game and combination of scrabble game and semantic-mapping strategies are good for the enhancement of students' general achievement in English vocabulary learning. This finding is supported by Umar and Ma'aji (2018) who explained that students taught with scrabble-based vocabulary instruction achieved better than their peers taught using other strategies in spelling. According to the scholars, this is because the game strategy encouraged visual learning, memory reinforcement, and teamwork, while enhancing vocabulary mastery. Also, Afolabi and Olagunju (2021) affirmed this finding by noting that scrabble game strategy is the most effective word games for vocabulary learning among primary school pupils. Furthermore, the finding is supported by Nnamani and Oyibe (2022) who posited that students' abilities to construct, pronounce, and explain new words more confidently are hinged on their exposure to vocabulary learning using scrabble-game instruction.

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Backing the complementary role of semantic-mapping in vocabulary learning, particularly when combined with scrabble game, Adeniyi-Egbeola noted it to be more effective in vocabulary achievement. Adeniyi-Egbeola (2006) supported this by stressing that the combination of two or more strategies goes a long way in enhancing vocabulary learning. She explained using multi-sensory and meta-cognitive approaches of teaching under-achieving secondary school students' vocabulary. To understand the contributory role of semantic-mapping when combined with scrabble game, Kholi and Sharifafar (2013) stated that semantic–mapping is a virtual strategy that enhances vocabulary development. Similarly, the finding is supported by Palma (2023) who pointed that the use of semantic mapping strategy is effective as a strategy to enhance vocabulary development and retention among learners of English Language. This finding is not far from the position of the proponents of schema, semantic field and componential analysis theories that are of the opinions that knowledge construction can be well aided by previous experiences in connecting the relationships among words. This is core to the use of semantic-mapping and scrabble-game as teaching strategies.

The Effects of Scrabble-game, Semantic-mapping and the combination of Scrabble-game and Semantic-mapping on the Achievement in Spelling of Secondary School Students in Okene, Nigeria

It was found in this study that significant effects existed among scrabble-game, semantic-mapping and combination of scrabble-game and semantic-mapping on students' achievement in spelling, with scrabble-game and combination of scrabble-game and semantic-mapping having significantly higher effect but not semantic-mapping as a lone. This finding corroborates the finding of Adeniyi-Egbeola's (2006) position that combining two strategies go a long way in enhancing effective vocabulary development. The finding also supports Beck, Mckeown and Kucan (2022) who explained that using combination of strategies to engage learners help them to retain words. However, the finding negates Palma's (2023) position that semantic-mapping as a separate teaching strategy makes students to be active in the classroom and enhances their achievement in vocabulary.

The Effects of Scrabble-game, Semantic-mapping and the combination of Scrabble-game and Semantic-mapping on the Achievement in Pronunciation of Secondary School Students in Okene, Nigeria

It was found from this study that scrabble-game, semantic-mapping and combination of both had effect on secondary school students' achievement in pronunciation. However, the combination of both scrabble-game and semantic-mapping had the most effect on pronunciation, although scrabble-game as a single strategy is equally very effective in the teaching of pronunciation. This affirms Lee's (2024) submission that interactions of strategies promote pronunciation in learners than using a single strategy. However, the finding negates Renata, Rija and Silva (2017) who pointed out that semantic-mapping strategy as an individual strategy could be appropriate for teaching pronunciation. This is also corroborated in the Constructivist theory which underscores social interaction as a basis for effective learning. So, since Scrabble game promotes discussion among students, improvement in pronunciation seems guaranteed.

Conclusion

This study examined the comparative effects of semantic-mapping and scrabble-game on English vocabulary achievement of secondary school students in Okene, Nigeria. From the findings of this study, it can be concluded that the general achievement of secondary school students in English Language vocabulary was average in Okene, Nigeria with 58.18% which is considered not good enough for the knowledge of vocabulary, being the building block for language learning. There is therefore a need for improved efforts on how vocabulary is taught to secondary school students, especially by activating students' schema to guide teaching. It can also be concluded from the findings of this study that scrabble-game and combination of semantic-mapping and scrabble-game have significant effect on the secondary school students' achievement in English vocabulary. However, semantic-mapping did not establish such an effect as a single strategy. At the vocabulary components level, it can be concluded that scrabble-game and combination of scrabble-game and semantic-mapping had significant effects on spellings and pronunciation, while semantic-mapping alone did not establish such effects.

Recommendations

1. Teachers and stakeholders should intensify efforts on how vocabulary is taught to secondary school students, especially by activating students' schema to guide teaching.
2. A combination of semantic-mapping and scrabble-game strategies should be encouraged in schools

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Evaluation on Integration of Basic Information and Communication Technology Literacy among Public Secondary Schools in Adavi Local Government Area of Kogi State, Nigeria

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Abstract

The integration of Information and Communication Technology (ICT) is increasingly recognized as a driver for educational inclusivity and improved learning outcomes. This study investigated basic ICT literacy as a tool for educational inclusion in under-resourced public secondary schools in Nagazi–Adavi Local Government Area, Kogi State, Nigeria. A descriptive survey design adopting a mixed-methods approach was used. Data were collected through structured questionnaires administered to 344 respondents comprising students, teachers, and non-teaching staff, alongside in-depth interviews with six senior school personnel. Quantitative data were analyzed using descriptive statistics and Chi-square tests at the 0.05 level of significance, while qualitative data were analyzed thematically. The findings revealed that ICT facilities were largely inadequate and that ICT use during classroom teaching was minimal. Although ICT was widely perceived to improve understanding and increase students' interest in learning, no significant relationship was found between ICT availability and educational inclusion. Although, basic ICT literacy showed a significant relationship with students' engagement in teaching and learning. In addition, challenges such as inadequate infrastructure, unreliable electricity supply, and limited training opportunities were found to significantly hinder effective ICT integration. The qualitative findings supported the survey results, highlighting infrastructural deficiencies alongside positive attitudes towards ICT. The study concludes that ICT has strong potential to enhance educational inclusion and learning engagement but remains constrained by systemic challenges. It recommends targeted government investment in ICT infrastructure, provision of alternative power sources, periodic ICT training for teachers, curriculum-based ICT integration, and strengthened multi-stakeholder partnerships.

Keywords: ICT literacy, educational inclusion, under-resourced schools, teaching and learning, Nigeria.

Introduction

Information and Communication Technology (ICT) has assumed a central role in contemporary educational practice globally, as digital tools increasingly shape how knowledge is created, accessed, and disseminated. Hence, digital literacy has become an essential tool for every student across the world (Okuribido and Ekosse 2025). ICT broadly refers to the use of computers, internet facilities, communication networks, and related digital technologies for processing and communicating information (UNESCO, 2019). In the context of education, ICT supports teaching, learning, assessment, and school administration, and has become a key driver of innovation and quality improvement in educational systems (Olusegun et al, 2025). As societies become more digitally inclined, basic ICT literacy has emerged as a foundational skill necessary for learners to function effectively in academic, economic, and social environments (Olusegun et al, 2025). Educational inclusion is concerned with ensuring that all learners, irrespective of socio-economic status, gender, geographical location, or physical ability, have equitable access to meaningful learning opportunities (Kwihangana, 2024).

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In developing countries such as Nigeria, achieving inclusive education remains a persistent challenge, particularly within public secondary schools that are under-sourced (Munje and Jita, 2020). Many of these schools operate in environments largely characterized by inadequate funding, poor infrastructure, limited instructional materials, and insufficient access to ICT facilities. These constraints often result in unequal learning conditions that alienate students from disadvantaged backgrounds and limit their participation in technology-enhanced learning.

The Integration of ICT into education has been widely recognized as a viable strategy for promoting educational inclusion. ICT literacy enables learners to access diverse learning resources, engage actively in classroom activities, and develop problem-solving and critical thinking skills essential for lifelong learning (Tinio, 2018 and Ainscow, 2020). In Nigeria, the Federal Government has acknowledged the importance of ICT through policies such as the National policy on Education and the National ICT Policy, which emphasize the integration of ICT at all levels of education (Jerry and Oweibo, 2024). Despite these policy commitments, the implementation of ICT programs in public secondary schools has remained inconsistent, particularly in rural and semi-urban areas (Richard, 2021). In many Nigerian public secondary schools, ICT facilities are either grossly inadequate or non-functional, while teachers and students often lack the requisite basic ICT skills needed to utilize available technologies effectively (kuribido and Ekosse 2025). This situation has contributed to a widening digital divide between well-resourced urban schools and under-resourced public schools, thereby reinforcing educational inequality. Students in under-resourced schools are consequently excluded from the benefits of ICT-supported learning, which negatively affects their academic engagement, performance, and preparedness for higher education and the labour market. Adavi Local Government Area of Kogi State exemplifies these challenges. Public secondary schools in the area are largely under-resourced, with limited access to computers, internet connectivity, and structured ICT literacy programmes. The absence of adequate ICT infrastructure and training opportunities restricts students' exposure to digital learning tools, thereby undermining efforts toward educational inclusion in an increasingly technology-driven society. Given the growing importance of digital competence, there is a compelling need to examine how basic ICT literacy can be leveraged to promote inclusive education in such contexts (Yakubu and Joseph, 2025). It Is against this backdrop that this study examines basic ICT literacy as a tool for educational inclusion in under-resourced public secondary schools in Adavi Local Government Area, Kogi State. The study seeks to assess the availability of ICT resources, determine the level of ICT literacy among teachers and students, and analyze the extent to which ICT literacy contributes to inclusive educational practices. By generating empirical evidence from Adavi LGA, this research aims to contribute to existing literature, inform educational policy implementation, and provide practical recommendations for improving ICT integration and promoting inclusive education in Nigerian public secondary schools.

Research Questions

The study seeks to provide answers to the following research questions:

1. What ICT facilities are available in public secondary schools in Nagazi–Adavi Local Government Area?
2. What is the level of basic ICT literacy among teachers and students in these schools?
3. To what extent does basic ICT literacy contribute to educational inclusion in under-resourced public secondary schools in Nagazi–Adavi Local Government Area?
4. What challenges hinder the integration of basic ICT literacy in public secondary schools in the study area?
5. What strategies can be adopted to improve ICT-driven educational inclusion in under-resourced public secondary schools?

Significance of the Study

The findings of this study will be of considerable importance to various stakeholders in the education sector.

1. Students: The study will highlight how basic ICT literacy can enhance students' access to learning resources, participation in classroom activities, and overall educational inclusion.
2. Teachers: The study will provide insights into teachers' ICT literacy needs and support the design of targeted capacity-building and professional development programs
3. School Administrators: The findings will assist school leaders in planning and prioritizing ICT resource allocation and integration strategies.
4. Policy Makers and Government Agencies: The study will offer empirical evidence to guide the implementation of ICT and inclusive education policies, particularly at the local government and state levels.

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5. Researchers and Academics: The study will contribute to the existing body of literature on ICT literacy and educational inclusion by providing context-specific evidence from Nagazi–Adavi Local Government Area.

Area of the Study

The study will be conducted in Nagazi–Adavi Local Government Area of Kogi State, Nigeria. Nagazi–Adavi Local Government Area is predominantly semi-urban and rural, with public secondary schools serving students from diverse socio-economic backgrounds. The area is characterised by limited educational infrastructure and constrained access to modern ICT facilities in many public schools. These conditions make Nagazi–Adavi Local Government Area a suitable setting for examining basic ICT literacy and its role in promoting educational inclusion in under-resourced public secondary school environments.

Research Design

The study adopted a descriptive survey research design using a mixed-methods approach. The quantitative aspect involved the administration of questionnaires to students and staff (teaching and non-teaching), while the qualitative aspect employed thematic interviews with selected senior staff. This design was considered appropriate because it allows for systematic collection and analysis of data on existing ICT literacy practices and educational inclusion in under-resourced public secondary schools.

Population/ Sample Size of the Study

The population of the study comprised students, teaching staff, and non-teaching staff of the three major public secondary schools in Nagazi–Adavi Local Government Area of Kogi State. These schools were purposively selected because they constitute the major public secondary schools in the area.

Table 1: Population of Selected Public Secondary Schools in Nagazi–Adavi LGA, Icluding Students and Staff (Teaching & Non-Teaching Staff)

SN	School	Total Population	Proportion	Sample size
1.	Ebira Community Secondary School (ECSS) Nagazi	771	771/2473 X 344	107
2.	Science Secondary School (SSS), Nagazi-Eba.	829	829/2473X 344	115
3	Government Science Secondary School (GSS), Ogaminana	873	873/2473 X344	122
Total	2, 473	2,473		344

The sample gotten from each school include both the students, teaching and non-teaching staff which was selected randomly within each school. The sample size for the quantitative component of the study was determined using the Taro Yamane (1967) formula, this is because Taro Yamene formula is specifically initiated for deriving a sample size for known population hence, most appropriate for this study. Therefore, the sample size for the study was 344 respondents, drawn from students and staff of the selected schools. A multi-stage sampling technique was employed. First, purposive sampling was used to select the three public secondary schools in Nagazi–Adavi Local Government Area. Second, proportionate random sampling was used to select students and staff from each school based on their population size. This ensured adequate representation of both students and staff across the schools. For the qualitative component, purposive sampling was used to select six (6) senior staff members (principals, vice-principals, and senior teachers) for in-depth interviews, based on their experience and involvement in ICT-related administrative and instructional activities.

Instruments for Data Collection

Two main instruments which are questionnaire and semi-structured interview were used to gather data. A structured questionnaire was administered to students, teaching and non-teaching staff. The questionnaire covered variables such as availability of ICT facilities, the level of basic ICT literacy, the use of ICT in teaching and learning, challenges to ICT integration in public secondary schools, and ICT literacy and educational inclusion. Responses were measured using a Likert-type scale. A semi-structured interview guide was used to conduct an in-depth interview with six senior staff members of the three public secondary schools in the research area. The interviews focused on variables such as ICT infrastructure, policy implementation, challenges, and the role of ICT literacy in promoting educational inclusion. Interview data were analyzed using thematic analysis.

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Method of Data Analysis

Quantitative data obtained from questionnaires were analysed using descriptive statistics, including frequencies, percentages, mean scores, and standard deviations. Where necessary, inferential statistics were used to test the hypotheses at the 0.05 level of significance. Qualitative data collected through interviews were transcribed and analyzed thematically through coding and categorization to identify recurring patterns and themes related to ICT literacy and educational inclusion.

Presentation of Results

Table 2: Presentation of questionnaire responses.

Section A: Availability of ICT facilities				
Questions	**SA**	**A**	**D**	**SD**
Computers are available in my School	103	69	86	86
My School has a designated ICT centre	138	83	76	48
Internet facilities are available in my School	7	17	48	272
ICT facilities in my School are functional	17	72	83	172
Section B: Basic ICT Literacy of Respondents				
Questions	**SA**	**A**	**D**	**SD**
I can operate computer without help	79	28	58	179
I can use basic word processing application	41	28	151	138
I can browse the internet for academic purposes	138	45	69	33
I can use ICT tools for assignment or tasks	172	86	52	34
Section C: Use of ICT in teaching and learning				
Questions	**SA**	**A**	**D**	**SD**
Teachers use ICT during classroom teaching	28	7	103	206
ICT is used for assignments and projects	138	67	86	52
ICT improves understanding of lessons	206	86	34	17
ICT increases students' interest in learning	224	69	34	17
Section D: ICT and Educational inclusion				
Questions	**SA**	**A**	**D**	**SD**
ICT Promotes equal learning opportunity	189	86	41	28
Students without ICT skills are disadvantaged	206	76	34	28
ICT enhance Students' participation	172	103	41	28
ICT reduces learning gap among students	165	110	41	28
Section E: Challenges to ICT integration				
Questions	**SA**	**A**	**D**	**SD**
Adequate ICT facilities are available	17	34	120	172
Electricity supply supports ICT use	10	24	103	206
Teachers receive adequate ICT training	52	69	120	103
Poor infrastructure limits ICT integration	224	69	34	17
Section F: Strategies for improving ICT integration				
Questions	**SA**	**A**	**D**	**SD**
Government should invest more on ICT	234	69	28	13
Alternative power source should be adopted	217	76	34	17
Regular ICT training for teachers is necessary	206	86	31	21
ICT should be fully integrated into the curriculum	224	79	24	17

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Table 3: Thematic Analysis of In-depth Interview responses (n=6)

Interview questions	Coded theme	Key indicator from responses	Link to Questionnaire question
Conditions of ICT facilities in Schools	Inadequate ICT infrastructure	Absence of functional computers, poor equipped ICT structures	Section B (ICT availability)
Usage of ICT in teaching and learning	Minimal classroom integration	Dominant use of chalk and black board, ICT only referenced and rarely used	Section D (ICT use in teaching)
Challenges to ICT integration in Schools	Infrastructure and power failure	Unstable supply of electricity, lack of funding and maintenance	Section F (ICT Challenges)
Attitude towards ICT	Positive attitude towards ICT	High student interest, admin willing to bring in professionals on part time if ICT is available	Sections D & E (engagement and inclusion)
Interventions needed	Institutional and government support	Demand for funding, training and alternative power source	Section G (strategies to improvement)

Table 4: table showing the summary of null hypotheses testing with (a) =0.05 level of significance

H_{01}: There is no significant relationship between basic ICT literacy and educational inclusion in public secondary schools in Nagazi–Adavi Local Government Area.

H_{02}: Availability of ICT facilities do not significantly influence the level of basic ICT literacy among teachers and students in public secondary schools in Nagazi–Adavi Local Government Area.

H_{03}: Teachers' ICT literacy does not significantly affect the integration of ICT into teaching and learning in under-resourced public secondary schools in the study area.

Hypothesis	Variables tested	X_2 calculated	df	X^2 critical	Decision
Ho_1	ICT availability x Educational inclusion	0.30	1	3.84	Not rejected
Ho_2	ICT literacy x Teaching and learning engagement	6.72	1	3.84	Rejected
Ho_3	ICT challenges x Effective ICT use	9.15	1	3.84	Rejected

Discussion of Findings

Below are the findings from the questionnaire distributed and in-depth interview conducted. It involves the hypothesis hypotheses testing and discussion of findings using evidences from both the questionnaire survey and in-depth interview data. The integration of mixed pattern (quantitative and qualitative data) strengthens the interpretation of findings.

Ho_1: states that there is no significant relationship between the availability of ICT facilities and educational inclusion in public secondary schools in Nsagazi-Adavi Local Government Area.

The Chi Square analysis shows that the calculated X^2 value (0.30) was less than the critical value (3.840 at 0.05 level of significance. Therefore, the null hypothesis was not rejected. This is becase responses revealed that computers, internet access, and functional ICT centres were largely unavailable in the sampled schools and also, the data collected showed strong agreement that ICT promotes equal learning opportunities, reduces learning gaps, and enhance participation. The interview data buttresses this result under the theme "inadequate ICT infrastructure" where respondents reported that ICT facilities were either absent or non-functional. However, school administrators admitted ICT's inclusive potential, and its absence limiting practical impact.

H_{02}: States that "there is no significant relationship between basic ICT literacy and students' engagement in teaching and learning". The calculated χ^2 value (6.72) exceeded the critical value (3.84). hence, the null hypothesis was rejected.Data from Section C of the questionnaire showed different levels of ICT literacy among respondents, while Section D revealed strong agreement that ICT improves understanding of lessons and increases students' interest in learning activities. In-depth interview responses where the theme "Positive Attitude towards ICT", indicates that students and teachers showed enthusiasm and higher engagement whenever ICT tools were introduced also supported this.

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H_{03}: There is no significant relationship between ICT integration challenges and effective use of ICT in teaching and learning". Quantitative analysis shows that calculated χ^2 value (9.15) was greater than the critical value (3.84), leading to the rejection of the null hypothesis. Findings from the questionnaire highlighted major challenges such as inadequate ICT facilities, poor electricity supply, and limited ICT training, as it was also observed that there is low use of ICT during classroom teaching. Interview data strongly supported this result under the theme "Infrastructure and Power Constraints", where respondents identified unreliable electricity as the most significant barrier towards ICT usage.

Discussion of Findings

The findings indicate that while ICT is widely perceived as a tool for educational inclusivity, its limited availability in public secondary schools especially the study area (Nagazi in Adavi LGA) has prevented measurable inclusive outcomes. This explains the absence of a statistically significant relationship between ICT availability and educational inclusion. The significant relationship observed suggests that basic literacy in ICT plays a crucial role in advancing teaching and learning engagement. Respondents with ICT skills were more likely to participate actively, complete assignments effectively, and show increased motivation. This highlights literacy in ICT as a basic driver of learner engagement in secondary education and the school environments. Significant relationship also indicated that infrastructural and systemic challenges directly affect effective ICT integration. Even where teachers possess basic ICT skills, the lack of facilities and stable power supply severely limits classroom application.

Conclusion

The study reveals that while ICT is widely recognized as a powerful and important tool for educational inclusivity and effective teaching, its impact in Nagazi–Adavi public secondary schools is constrained by inadequate infrastructure in most school and unreliable electricity supply where structures and facilities exist. Basic ICT literacy significantly enhances students' engagement in learning, but systemic challenges limit sustained classroom integration. The convergence of questionnaire findings and thematic interview evidence confirms that improving ICT outcomes in public schools especially those that are under-resourced requires not only skills development but also substantial infrastructural and policy support.

Recommendations

From the findings of this study, the following recommendations are proposed:

1. Government investment in ICT infrastructure: government at all level should prioritize the provision of functional and effective ICT facilities in public secondary schools. Facilities such as computers, internet access, and a well-equipped ICT centres especially in under-resourced rural areas such as Nagazi public secondary schools.
2. Provision of alternative power source: persistent challenges of unreliable electricity supply have been documented hence, schools should be supported with alternative power source such as solar power to solve this, as it will ensure consistent ICT usage for teaching and learning.
3. Periodic ICT training for teachers and school administrators: regular ICT training programmes should be established to improve teachers' competence and ability in integrating ICT into classroom instruction and assessment practices.
4. Curriculum-aligned integration of ICT: ICT use should be embedded across subject areas instead of being treated as an extra-curricular activity. This will help students develop digital skills through formal learning experiences.
5. Multi-stakeholder support and partnership: collaboration among government agencies, private sector partners, community organizations, and non-governmental organizations should be encouraged to support ICT provision, maintenance, and capacity building in public secondary schools.

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Qualitative Study on Correlation between Cognitive Preference style and Achievement in Sciences at Secondary School level of Education in Nigeria

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Abstract

This study explores the relationship between cognitive preferences and scientific achievement through both theoretical frameworks and empirical investigation. Drawing on models of cognitive styles such as analytic versus holistic processing, field dependence-independence, and divergent-convergent thinking the research examines how individual differences in preferred modes of information processing influence the pursuit and attainment of scientific knowledge. The theoretical analysis situates cognitive preferences within broader psychological and educational paradigms, highlighting their potential role in shaping creativity, problem-solving strategies, and disciplinary specialization. Empirical findings, based on surveys and performance measures of scientists and students across diverse fields, reveal significant correlations between specific cognitive styles and indicators of scientific productivity, including publication output, innovation, and recognition. The study concludes that cognitive preferences are not deterministic but act as enabling or constraining factors that interact with environmental, motivational, and social variables. Implications are discussed for science education, talent development, and fostering interdisciplinary collaboration. In light of these findings, it is recommended that educational systems cultivate awareness of diverse cognitive styles, or cognitive preferences, and integrate flexible pedagogical approaches that nurture both analytic and holistic thinking, encourage environments that balance individual strengths with collaborative opportunities, and design talent development programs that recognize cognitive diversity as a resource for innovation. Furthermore, fostering interdisciplinary platforms that bridge different cognitive orientations can enhance creativity and resilience in scientific practice, ensuring that cognitive preferences are leveraged as assets rather than limitations in the pursuit of knowledge.

Key Words: Cognitive Preferences; Scientific Achievement; Cognitive Styles

Introduction

In recent years, an important characteristic of the new science curricula has seen an increased emphasis placed on concept formation, scientific principles, inquiry processes and critical thinking. The implicit in this approach is the assumption that the teacher and the way he deals with the curriculum may influence the students' cognitive styles. Evidences show that every individual differs substantially in his styles of thinking and experience (Heath, 1964; Messick, 1976; Bajah, 1981;

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Sawyer, 1987). It has been noted that study in cognitive styles area are today making considerable impact on science teaching, by revealing how people learn science (Busari,1991; Igwebuike,1991). Research has shown that cognitive style is different from intellectual abilities. According to Messick (1982), dimensions of intellectual ability refer to the content and level of cognition. Meanwhile, it refers to the questions of what? and how? What kind of information is being processed by what operation and in what form and how well? While, cognitive style refers to the manner or form of cognition. Witkin (1977) and Messick (1982) made further distinctions between cognitive styles and intellectual abilities. They all maintained that intellectual abilities are content or domain specific such as verbal or numerical, whereas cognitive styles cut across both ability and personality domains. The concept of cognitive styles is simply associated with the area of psychology known as psychological differentiation. This simply means that differences exist between individuals in relation to their psychological functioning. The two terms, cognitive preference and cognitive styles may be used interchangeably, hence the differences between the two is said to be artificial (Heath, 1964; Tamir, 1977). But, there is a slight difference between the two terminologies. In other words, a choice in each item in which options are provided reflects a cognitive preference, while the emergent dominant preference constitutes a style Heath (1964). Thus, this study investigated the concepts of cognitive preferences, scientific achievement as well as empirical studies conducted in these areas.

Methodology

The study design is qualitative approach which involved the use of documents. A qualitative approach where documents are used. The words used in scratching the documents include: cognitive preferences, scientific achievement, cognitive styles, curriculum, cognition and science. The data bases use searching the articles include: ResearchGate; google scholar; Emerald; ProQuest among others. Initially, 55 articles were down loaded and filed in folder. The inclusion and exclusion caret aria were used. First, screening was done where the relevant articles related to this study were sorted and used in this study, whereas, the one irrelevant were not excluded in the study. Finally, 45 articles were found relevant and used the study, while the remaining 10 were discarded. Figure 1 below summarized the methodological flow.

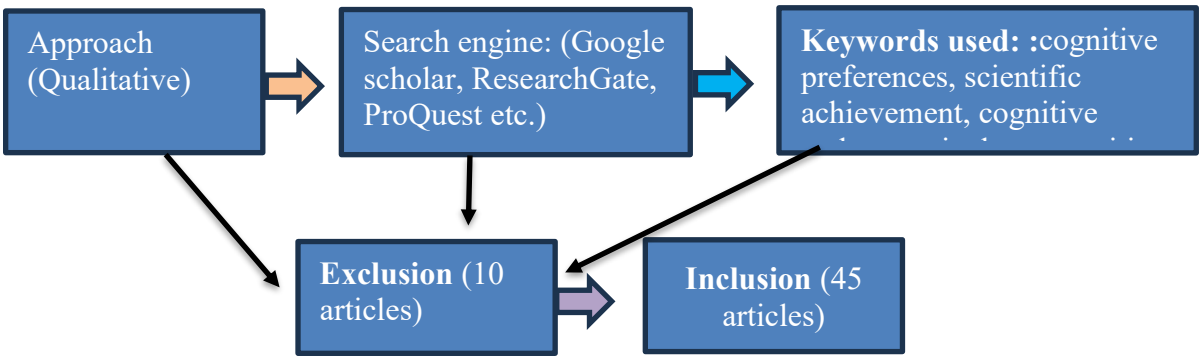

Figure 1. The methodological flow.

Conceptual Definition of Cognitive Preferences

Heath (1964) defined cognitive preference as the internal unseen mode of an individual that leads to exhibiting the cognitive styles which can be seen externally while; Massick (1976) defined cognitive style as a consistent way a person has of organising and processing information and experience. Witkin (1977) also defined cognitive style as characteristics and consistent mode of processing information, constructing relationship and solving problems. But Reissman (1966) was one of the first to emphasise the importance of cognitive styles. He traced that each individual has a distinct style of learning in much the same way that each individual has a distinct personality. Reissman (1966) believed that differences in cognitive styles reflect differences in personality; He mentioned that cognitive styles are developed early in life as a result of a combination of predisposition and environmental experiences. Witkin (1977) stated that the relationship between one's cognitive style and one's subject interest serve as a guidance tool for the students and counsellors, who assist students in selecting suitable career choices. In Nigeria, the definition of cognitive style has also been preferred among which are: Shuaibu and Ogunsola (1982) defined cognitive style in science as the mode of presentation of scientific information which

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the individual student would find easy to remember. Omoifo (1986) also defined it as individual preferences or tasks. This suggested that "modes" primarily are regarded as preference while the "body" preference which is the characteristics of an individual is referred to Style. From the above definitions, the most important thing to note is that they all stressed the way and manner individual processed information. But all these definitions and differences in cognitive styles and intellectual abilities have limited educational value unless and until they can be integrated with the science teaching education programmed to improve teaching-learning processes. Secondary school education at senior level in science education has witnessed a lot of curricula development activities. Universities and colleges complain about insufficient science entrant and blamed the secondary school teachers. The pressure on secondary schools offering is justified by the notion that science secondary student' cognitive traits have certain educational implications to the present day school curriculum; the fact is that no matter how the school curriculum is designed or developed, it may not be successful without proper implementation. For an effective learning to be achieved the senior secondary school curriculum is expected to reflect the four modes of cognitive preferences (Recall, Application, Principle and Questioning) because a student who is said to have one mode of cognitive preference does not mean that he does not possess the other modes (Tamir, 1982). It has been suggested by Muhammad and Hano (2012) that, Government should consider all secondary schools in the designing and developing secondary school curriculum, and enough instructional materials should be provided to enhance learning. Heath (1964) was the founder of cognitive preference, He defined cognitive preference as the internal unseen mode of an individual that leads to exhibiting the cognitive styles which can be seen externally while; Witkin (1977) on the other hand, defined cognitive style as characteristics and consistent mode of processing information, constructing relationship and solving problems. Muhammad (2009) traced the four classes of cognitive preferences postulated by Heath 1964 which Heath called them "Four cognitive preferences fields". These four modes of attending to scientific information are:- **Recall (R):** This is a mode in which students merely remember facts or statements associated with a topic without questioning and not bothered about application; **Principles (P):** It is a mode whereby students are interested in the basic upon which such facts are built i.e. principles involved in the topic; **Applications (A):** In this mode, the students show interest in the usefulness of the topic being presented to them, and a preference for scientific information in view of its emotional applicability in a general social or scientific context; **Critical Questioning (Q):** This is a mode by which learner is expected to choose his goal, work out strategies for the attainment of goal, manipulate and control his environment. Questioning is a preference for critical questioning or criticism of scientific information as regards to its completeness, general validity or limitation.

Apart from Heath (1964) the cognitive preferences have been recognised by other researchers such as Kampa and Dube (1973), Tamir (1978), Jungwirth (1980), Messeng (1980), Ogunsola and Shuaibu (1983), Abah and Jegede (1990), Wasagu (1991), Muhammad (2009), Mckay and Alwi (2011), Novak (2009), Reuven and Palaniappan (2010) and Zhidong (2013) among others. The available literature on Cognitive Preferences and Scientific achievement is reviewed under the following headings: A review of cognitive preferences and scientific achievement; A review of cognitive styles and Academic achievement

Empirical Studies on Cognitive Preferences

In addition, the word cognition refers to the mental process in the brain used to gain knowledge and comprehension of the outside world (Gibbs 2009), while, cognitive preference is an internal unseen mode of individual that lead to existing cognitive styles which can be seen externally (Heath 1964), in other words Witkin (1976) considered cognitive preferences as intellectual style of an individual upon the presentation of a cue with several responses available that refer to specific mental choices, this choices are the Recall (R); Application (A); Principle (P) and Questioning (Q) as proposed by (Heath 1964). Novak (2009) suggest that conative preferences and the implications that come from the dominance of single style in society reach far beyond simple schooling and fairness in academia. Cognitive preferences was first investigated by Heath (1964) and validated by Tamir (1988). However, in recent years cognitive preference was investigated by different researchers such as Wasagu (1999); Bachi and Udi (1990); Abah and Jegede (1990); Lim (2008); Muhammad and Hano (2011) Novak (2009); Muhammad (2010); Reuven and Anton ;(2010); Caesar and Reuven (2010); Muhammad and Mkay (2011); Mkay and Alwi (2011) and Zhidong (2013) among others. Cognitive preference is one of the aspects of cognitive styles that has been investigated over 50 years and considered as one of the significant aspects on science teaching and learning. Cognitive preference was known in science education research since 1960 because of the logical connection between the designing and development of science and curriculum projects. Cognitive Preference was studied mainly in relation to the learning science where they refers to the modes used by dealing with scientific information (Tamir 1981),

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the available literature justified this as all the reviewed literatures were on sciences, research on cognitive preferences has been investigated over decades; cognitive preference in individual has been a topic of interest for researchers when explaining the complexity of effective human computer interaction (Alwi 2011). Bachi (nd) noted that there is an ardent need to revamp the existing educational programmes and suitably modify conditions which are known to alter or influence cognitive preferences to certain leaning styles. Evidences show that every individual differs substantially in their styles of thinking and experience (Heath, 1964; Messick, 1976; Bajah, 1981). It has been noted that studies in cognitive styles area are today making considerable impact on science teaching, by revealing how pupils learn science (Busari, 1991; Igwebuike, 1991). Ogunsola (1980) traced out that at the start of the experiment subjects, cognitive preferences were comparable to another pre-degrees students in Ahmadu Bello University, Zaria Nigeria and the order of preferences are as follows:

R ⟹ P ⟹ Q ⟹ A in the ratio: 1.57:1, 37:1, 2:1.

When all sub-groups were set aside E^{ii} and C^{ii} groups without the pre-test were compared significant. Mann Whitney U-values were obtained at $P<0.05$. There was a statistically significant gain on Q suggesting that the treatment had the desired effect for this sub-group and that the pre-test may be counterproductive in this case. The study also shows a statistically significant gain in questioning, which was the experimental target. But there was a statistically significant drop in application. It is noteworthy that there was a gain in R and a loss in P although these gains were not statistically significant. This result confirms indirectly the orthogonal relationships between R-Q and P-A which was proposed by Tamir and Kempa (1978) and suggests the possibility of shifting student's cognitive styles from predominantly Recall (R) to Questioning (Q), using an appropriate instructional strategy. In another hand, Wasagu (1991) revealed that: generally, there was no significant difference between boys and girls when a cultural belief was correlated with gender and cognitive preference versus gender; there were about the same number of males and females in terms of proportion who were found to be high achievers; and a significant difference was established between age of students and cognitive preferences. These findings do not support the works of Abah and Jegede (1990) because they had noted a significant difference between ages of students and their cognitive preference; consequently, Tamir and Lunetta (1978) conducted a study titled "cognitive preference in Biology of a group of talented high school students". They found that there were high preferences for 'Q' and low preferences for 'R'. This preference pattern represents a very high level of intellectual curiosity and a desire to learn science more. And there was a lack of distinct relationship between cognitive preference and some of the background variables (i.e. gender, religion and hobby) which was attributed to the homogeneity of the sample. Most of the earlier researches concentrated on identifying cognitive preference or cognitive styles of students in Biology, Chemistry, Physics computer science and Agriculture. The cognitive preferences and problem solving in Chemistry, an attempt to shift students' cognitive styles through teaching and cognitive preferences and creativity on the other hand have been similarly investigated. But little has been reported about cognitive preference in relation to science in general and cognitive preferences and scientific achievement and only few researchers relate their findings with curriculum development. Hunt etal (1989) demonstrated that individuals learn more effectively from teaching methods which are consistent with their modes of thinking. However, in the typical classroom situation, where the didactic approach is commonly used, it will be impracticable to teach individual students according to their cognitive styles. There is nothing to suggest but, in a mass education supported system, an individual cognitive style is the most desirable. If the students can be assisted through teaching to shift their cognitive style in the desired directions they will learn more effectively (Okebukola 1988; Ogunsola, 1980). Okebukola (1985) in particular reported significant differences in cognitive styles between successful and less successful science students in Nigeria.

These efforts of classification however, have limited educational value unless and until they can be integrated with the teacher education programmed and curriculum development to improve the teaching learning processes, and effective learning to be achieved the junior secondary school curriculum is expected to reflect the four modes of cognitive preferences (Recall, Application, Principle and Questioning) because a student who is said to have one mode of cognitive preference does not mean that he does not possess the other modes (Tamir, 1982). The educational concern is how the teacher might shift students' cognitive styles from one mode to another, in this case from Recall (R) ---------> Questioning The potency of the defining issue-discussion approach has been well demonstrated, Rest (1974) pioneered on approach to changing the moral judgment of individuals in a desired direction using the Defining Issue Approach (DIA) students were presented with dilemma stories involving moral issues. The issues were discussed in the open among colleagues. Individual

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opinions and judgments were sought through discussion. It was hoped that the individual's judgment may be improved along the development stages proposed by Kohlberg (1963). The criterion test was a Defining Issue Test (DIT). The original DIT consisted of six hypothetical stories involving crucial moral issues. The test was a recognition task which enabled the subjects to rank four issue statements from a set of 12; each which was written to exemplify the characteristics of one of Kohlberg's stages of moral development, the approach has been widely used in several countries with a remarkable amount of results (Rest, 1974 and Okatahi 1984). The theories of Piaget, Bruner and Gagne have had a major impact on primary science and e integrated science and senior secondary school curriculum development. The theories have implications for what is to be taught, how it should be taught and the consequence in which it should be taught. According to Piaget (1930) children develop their intellect in a sequence of stages from neonatal to infancy to post adolescence. All children may have the same sequence of stages but, the rate at which a particular child passes through these stages is greatly influenced by nature and nurture. Piaget (1929) revealed four (4) stages of intellectual development are:

1. Sensorimotor stage (0-2 yrs.) the key features of this stage are: object permanence
2. Pre operational stage (2-7 yrs.), with Egocentrism feature
3. Concrete Operational stage (7-11 yrs.) the key feature is Conservation
4. Formal Operational stage (11/12 yrs. +) Manipulate ideas in head, (e.g. Abstract and Reasoning).

According to Eboy and Mulner (2014) Each stage of development has approximate age, the sensorimotor stage is between 0 to two years of age, Preoperational stage from two to seven years of age; Concrete operational seven to eleven years while, Formal Operational stage is eleven years to Adult, this study titled Cognitive preferences and scientific achievement among science secondary school students of form six students will used Formal Operational stage because the students may fall at the age ranges 0f 18-21. According to Piaget a child's cognitive development is about a child developing or constructing a mental model of the world. This indicated that His interest is on children and concern in what they learn and how they thought in a different ways. Zimbardo (1985) mentioned that Jean Piaget devoted much of his life to studying children's cognitive development- the way mental process such as thinking, reasoning and perceiving the word. Despite all his effort, Piaget was criticized that he ignored cognitive development after adolescence and failed to consider the developmental stages beyond formal operational stage, one of the critics is Koplowiz (1990) who said there should have been another stage after Formal Operational stage; this stage called it a stage of unitary operation.

Burner's theory noted that any subject or topic can be taught effectively in some forms to any child at any stage of development, when teaching science, which contradicted Piaget's view, it is necessary to help the child to pass progressively from one stage of intellectual development to the next by probing the child with challenges and opportunities which can help the child forge ahead into the next stages of development. According to Burner, science programmes or curriculum needs to be built around major conceptual schemes, skills and values of societal importance. It is recommended by Burner that a child in the elementary school should be encouraged to learn through discovery. On the other hand, Gagne is concerned with successful teaching and learning of inquiry which is a vital goal of science education. Gagne noted that science instructions to a child should be in a certain kind of skills which include number computation, spatial and manipulative skills. The skills of observing, describing, classifying, measuring, inferring and model conceptualising are also expected to be included. Task analysis is aimed at analysing complex into relatively simple ones. It is through task analysis that a number of intellectual processes like memory storage, search, retrieval, transforming, control of variables and others can be achieved. The self-regulation theory involved an active internal mental process of forming new reasoning pattern which teaches on how to compare new ideas being compared with old ones. It encourages students to get involved in analysing a problem situation considering tentative solutions to problems evaluating effectiveness of such solution proffered and introducing new approaches when such first possible trial solutions fail. One can bring a science instructional technique that embodies much of Piaget's equilibration theory (Renner and Lawson 1973). There are three phases learning cycle was developed and refined by the Science Curriculum Improvement Study (SCIS) of the University of California. The three phase learning cycle is said to have the advantage of:

1. Developing the questioning attitude of the learner of his studies while discouraging
2. The unquestioning acceptance to vaguely understood principles and procedure.
3. Leading a learner from physical action domain to abstract mental operations and hence conceptualisations which are

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formal thought.

In a related development, Wasagu (1991) conducted a study concerned with the relationship between cognitive preference and attitude towards science, among secondary science students. The study revealed that, there was a significant relationship between cognitive preference orientation and attitudes toward science among student in secondary school in Sokoto State. It was indicated in Kalgo (1993) that sex is a more dominant factor than cognitive style or personality differences in the academic achievement of boys and girls, also shown that it is the sex of an individual rather than his or her cognitive style or personality type that determines his or her academic achievement in the subjects used in that study. In recent years, an important characteristic of the new science curricula has seen an increased emphasis placed on concept formation, scientific principles, inquiry processes and critical thinking. The implicit in this approach is the assumption that the teacher and the way he deals with the curriculum may influence the students' cognitive styles unrelated to intelligence, and there is the need for the science teachers to note all the four cognitive preferences of the students and relate them to their teaching strategy in order to improve learning efficiency. There is the need to have knowledge of the relationship between the cognitive demand of a subject matter and a learner's level of development. A teaching strategy can be frustrating, interesting, challenging or meaningless to a child depending on the cognitive competences of the child.

From research findings, most secondary school students operate at the concrete operational stage Akanbi (1988). Piaget explains this stage as children develop the ability to use logic and stop lying so heavily on simple sensory information to understand the nature of things. In other words, they acquire the capacity to perform mental operation silently in their heads. Piaget called these skills concrete operations. As children depend on reason to solve problems, their resourcefulness in categorising and classifying objects expands appearance differs from reality; one is temporary, while the other is permanent. In the identification of knowledge by Piaget, physical knowledge refers to knowledge of object specific properties that can be observed and gained directly from internal reality, that is to say recall and application cognitive preferences. The logical-arithmetical knowledge, that is to say principle involves relationships introduced among objects, social knowledge are facts and truths which are firmly noted in the norms and values of the people among whom is even a child. The socio culturalist perspective recognises emphasis on the socially and culturally situated nature of their science, technology or mathematical activity. The process of learning is primarily one of the social constructions, Drive (1994). In other words, the socio culturalist concern lies in helping students to view the scientific disciplines as social disciplines in groups of people functioning together by virtue of sacred cultural practices (Wasagu, 1998). A child from primary school entering into a junior secondary school is assumed to have acquired a personal initiative through elementary understanding of what science is. Primary science is one of the subjects being taught at the primary education level. A primary school leaver may be familiar with a few principles of primary science which have been arrived through personal experiences. Students learn through their own actions in a new situation. Students can explore new materials and new ideas with minimum guidance or exception of specific accomplishment which can also be effectively done in a laboratory set up, Karpus, (1977). Learner's questions arising before a teacher, due to new experiences acquired by such learners. Learners' exploration and invention of knowledge acquisition can be applied to new reasoning patterns to additional examples, new situations and greater challenges leading learners to a discovery stage in integrated science. Mark (1967) was the first to join Heath who modelled his study as "cognitive preference test in high school chemistry". It was based upon Heath test, and using the same approach as Heath compared the scores of students in the Chemical Bond Approach (CBA) chemistry courses. He also demonstrated similar differences on the CPT scales between CBA and control a group of students as Heath did between the two physics groups. Mark (1967) showed that cognitive preferences were unrelated to ability.

In a related development, Kempa and Dube (1973) carried out study in Norwich in order to determine science based cognitive preference orientation in students, subsequent to the study of chemistry at the general certificate in education (ordinary level). In their study 40 items chemistry based cognitive preference test was developed and administered to the 284 undergraduate students. The subject content of the instrument corresponded closely to that of current 'O'-level chemistry curricular. Result from the study showed that the cognitive styles of different ability groups contrast markedly. They reported that higher achievers tended to exhibit a high degree of scientific information learned distinctively towards the pure science scale. Low achievers lacked scientific curiosity and accepted science primarily because of the uses that may be derived from it rather than because of its intrinsic values as a field of intellectual enquiry. Tamir and Lunetta (1978)

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conducted a study titled "cognitive preference in Biology of a group of talented high school students". In their study, they examined the effects of secondary science curricular and other variables on the cognitive preference of talented students. 40-items biology cognitive preference test, designed and validated by Tamir (1978) was administered to 177 science oriented high school students throughout the United States. However, the responses of extension statement for each item were all correct. Tamir and Lunetta (1978) found that there were high preferences for 'Q' and low preferences for 'R', this preference pattern represents a very high level of intellectual curiosity and a desire to learn more, and there was a lack of distinct relationship between cognitive preference and some of the background variable (i.e. gender, religion and hobby) which was attributed to the homogeneity of the sample, they also found that both readers and frequent readers of scientific literature differed from a middle group of readers but were not significantly different from each other in cognitive preference; no statistical significant differences were observed in cognitive preference among groups of the sample divided according to gender, hobby and religion; they also showed that there were no statistically significant differences between ipsative and normative sub tests. Tamir and Lunetta (1978) concluded that both ipsative and normative procedures gave the same ranks orderly mean-score. Because, the interrelations between (R, A, P and Q) were all positive with the exception of one (Application) which was moderate and statistically significant. In a related development,

Naught (1982) conducted a study to find out the relationship between cognitive preference and pattern of achievement in chemistry for grade 12 students in Australia. Naught (1982) used the four different cognitive preferences postulated by Heath (1964). His data were analysed by using both modified R-technique factor analysis and the multidimensional unfolding technique. The results of his study were consistent with the following two general propositions: Students who develop the cognitive preference consistent with those implied or stressed by the high school certificate chemistry course tend to perform better in an end-of-course achievement examination than the students whose cognitive preference are not consistent with those implied preference. Higher cognitive preference for a particular preference is positively correlated with performance on the shorts of cognitive tasks implied in that preference. In a related development, Tamir and Kempa (1978) carried out a study "cognitive preference styles across Three Science Disciplines". The four cognitive preference originally suggested by Heath (1964) were used in their study. Three cognitive tests, in physics, chemistry and biology which has been designed and validated in the University of East Anglia under the supervision of Kempa were translated into Hebrew with some modifications. Each of the three tests comprised of 20 items. The tests were administered to length grade students. Tamir and Kempa (1978) found that the length grade students possess a general cognitive preference style in science which cuts across the three major disciplines namely; physics, chemistry and biology; yet this general style does not account for all of the variance, and the specific cognitive preference patterns, which differ from each other, exist to each of the three-science discipline. This difference however, is similar between the physical science disciplines: physics and chemistry, relative to the difference between each of them and biology, The results revealed that all subjects showed higher preferences for recall and principles, than application and questioning; there was a tendency to prefer more 'R' than other styles in chemistry and tendency to prefer more "P" than other styles in biology; CESAC students pattern of cognitive style did not differ significantly from the pattern of non CESAC students; and the effect of the curriculum material on the pattern of students' cognitive styles appeared to be minimal.

In a related development, Ogunsola (1981) examined all school of basic studies, Ahamadu Bello University Zaria, fresh students in chemistry department admitted in the 1981/82 session responses to stimuli in the forms of chemistry questions collected from SBS entrance examination over the year. He found that: More male students showed greater preferences for principle than female students who showed greater preferences for recall, application and questioning. Most students who schooled in the South showed greater preferences for principles than those who schooled in the North, who showed greater preferences for recall, application and questioning. Joe (1983) carried an exploratory study of some Nigerian students' cognitive preference in biology. The study was done in River State Nigeria, with 180 form five students drawn from six schools. The result showed that on the average, the students had a high linking for principles preference followed by recall, application and questioning. It also showed that the least preferred mode among the researched was questioning. Equally, sex and anticipated career did not significantly correlate with all four cognitive preferences. There is no much difference from the above study with that of Ogunsola (1981). It can be also noted that while Recall (R) is the most preferred mode, Principle (P) is the most preferred in Joe (1983) otherwise, everything is the same. Abah and Jegede (1990)

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carried out a study on a comparison of the cognitive preferences of science students at three hundred level of education in Zaria. Their instruments which were used to measure the subjects are cognitive preference test in physics (CPTP), cognitive preferences test in chemistry (CPTC) and cognitive preference test in biology, (CPTB) respectively, the instrument consist of 20 items each. Abah and Jegede (1990), revealed the following results: Secondary school students showed the highest preference for questioning followed by undergraduate students, with school of basic studies students showing the lowest preference for questioning; school of basic studies students showed the highest preference for principles, followed by undergraduate students with secondary school students showing the lowest preference for principles; of the three samples undergraduate students showed the highest preference for Recall in two tests (Biology and Chemistry); the school of Basic studies students showed the highest preference for Recall in one test (the chemistry test); secondary school students did not show the highest preference for Recall in any test instead exhibited the lowest preference for Recall in two tests (the Biology and Chemistry tests). The above findings showed that Recall mode is still the most dominant preferred mode among the Nigerian students at almost all levels of education (i.e. primary, secondary and tertiary institutions). The poor achievement in the science among youth presently in Nigeria might have been caused by the Nigerian students mode of preferences at all levels of education. The curriculum progress will very much depend on the extent to which it will succeed in steering the work of different perspectives so that they can contribute in a co-coordinated and co-operative way to the development of new physics curricula and new ways of teaching. According to Lijne, (2007) The curricula that focused on physics as a discipline demands, to be more geared to the less able, and less scientifically interested.

Recently there is growing interest in pursuing research on cognitive preferences as demonstrated by the number of new studies that involve web-mediated instructional environment (Mckay 2011), but the interest should not only be in one subject area because the study of cognitive preference often term as learning styles or thinking styles has become widespread within the field of psychology (Novak 2009). Heath (19664) stressed that cognitive preference and cognitive styles are two different terms, but, may be used interchangeably, hence the differences between them said to be artificial (Tamir 1977). The pedagogical activities are organised around survey and practical work from which observations are made and questions are drawn. More so, from pedagogical aspect, it implied active participation by the pupil in the learning process; use of the experimental method practice of formulating and solving problems. However, through teaching a teacher can make an attempt to shift student's cognitive preference from predominantly Recall (Recall) to Questioning (Q) using Rests Defining Issues Discussion Approach as Ogunshola did. Ogunsola (1994) conducted an exploratory study on how to shift student's cognitive preference. A total of 69 pre-degree students from a college of Agriculture participated in the experimental study. Subjects were assigned randomly to one of the groups in the Solomon 4-way design models, so that E^{i}=23, E^{ii}=16, C^{i}=19, C^{ii}=11. Treatment consisted of three weeks of specially packaged instruction in A-level chemistry, Tamir and Kempa's cognitive preference test was adapted as the criterion measure. Ogunsola (1994) traced that at the start of the experiment subjects, cognitive styles were comparable to another pre-degrees students in Ahamadu Bello University, Zaria Nigeria and the order of preferences are as follows: R----------> P ----------> Q ----------> A in the ratio: 1.57:1, 37:1, 2:1. When all sub-groups were set aside E^{ii} and C^{ii} groups without the pre-test were compared significant. Mann Whitney U-values were obtained at $P<0.05$. There was a statistically significant gain on Q suggesting, that the treatment had the desired effect for this sub-group and that the pre-test may be counterproductive in this case, the study also shows a statistically significant gain in questioning, which was the experimental target. But there was a statistically significant drop in application. It is noteworthy that there was a gain in R and a loss in P although these gains were not statistically significant, this result confirms indirectly the orthogonal relationships between R-Q and P-A which was proposed by Tamir and Kempa (1978) and suggests the possibility of shifting students cognitive styles from predominantly recall to questioning, using an appropriate instructional strategy.

It was revealed by Wasagu (1988) that there was no significance difference between boys and girls when cultural belief was correlated with gender and cognitive preference, but, gender was found to be important for recall and critical questioning this was also indicated by Bachi (nd), Muhammad (2009) in contrast Hyde (2005) found that female and female were found similar in their cognitive skills. Naught (1982) conducted a research on cognitive preferences using Heath model, the statistical method used was R-technique factor analysis. His study shows that students who develop cognitive preference with those implied stressed by the higher school certificate chemistry course tends to perform better in an end

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course achievement examination than the students whose cognitive preferences are not consistent with those implied preference .these differences in cognitive preferences differences exist not only among students but within the teachers because, a study was conducted by Bachi and Uddin (1990) compared how cognitive preference differs in groups of secondary school teachers identified by type of curriculum taught, gender and length, the combined cognitive preference inventory complied by Pincha Tamir was applied to 1003 teachers, their study revealed that with few exceptions, the overall pattern of cognitive preference that emerged for all groups is recall-principle, application-questioning. But, they did not link the implications of their findings to teaching and learning, therefore a research that will find the cognitive preference and scientific achievement with its implication to curriculum development is needed. Recently, Hau etal (2013) found that; Quick Response (QR) code was mainly used as a speed and ready access to multimedia contents such as a speedy and ready access to multimedia content such as web site, data bases, audio and video files, questions and answer text and so forth; and most of the research topics covered in the previous studies involving the adequacy of QR code as an enable in various types of instructional approaches, instructional approaches covered included, experimental learning, collaborative learning, discovery learning, Science Technology Society approach and so forth.

It was reported by Mackar and Alwi (2011) that cognitive preference in individuals has been a topic of interest for researcher when explaining the complexities of effective human-computer interaction, they also found that there are interactive effectives and exhibits display format on quality of the resulting human computer interactions (HCL), this was supported by Smith (2008) who stressed that over the past 30 years, a body of scholarly research has accumulated within the learning literature, involving computer-mediated instructions (CMI) that address several cognitive psychological characteristics which are linked to broader concept either an individualistic or a social/cooperative learning styles: thus by examining what students were learning about scientific investigations, the research found that the students experienced curriculum appeared to be focused on narrow view of scientific inquiry as far testing and acquiring assessment technique (Hume and Coll 2009). Novak (2009) seek to found the cognitive preference and ethnic identity among Angola and Native Americans high school students. The findings of their study indicated that Angola and Native Americans have statistically different cognitive preferences and those preferences were correlated with their ethnic identity. It was indicated that in Nigeria almost all levels of education exhibit Recall (R) mode as their dominant mode (Muhammad 2009). In relation to this another study was conducted by Palaniappan (1998) investigated the cognitive preference and figural creativity among Malaysian undergraduate students, 130 female with age range 23-27 year old enrolled, in the education department of the university of Malaya where the sample, two different instruments where used Tolerance Test and creative thinking (TTCT) and combine cognitive preferences inventory (CCTI). The results revealed that the correlation between recall (R) and Questioning (Q) modes was negative and statistically significant, indicating that the student ranked Recall (R) items highly and gave low rank to Questioning (Q) and vice versa. Also found in the study that student who used the Recall (R) mode of thinking had a low preference for Application modes and vice versa, in most cases, every successful learner learns in different ways on the whole, every student has certain degree of preferences in each type of learning style and majority of the sample have dominance in one or more styles of learning (Zaionol Abidin et al., 2011).

Most of the literature reviewed on cognitive preferences reported that Nigerian students most dominant preferences is (R) recall mode Wasagu (1988) this findings was supported by Bachi (1990), Muhammad (2008), Abah and Jegede (1990), Ogunshola (1994) But, did not support the results of joe (1983) and Reuven and Caesar (2010) who their results analysis of biology cognitive instrument shows that (p) principle was the most preferred mode by students and teachers followed by q questioning mode while, recall (R) and application (A) were the lowest preferred modes, in the same vein, Tamir and Lunetta (1978) found that there were high preferences for Q questioning and low preference for recall (R). The study of cognitive preference often termed learning styles or thinking styles has become widespread within the field of psychology (Novak 2009). The implications of these insights are particularly important for educational institutions (Moore 2002). In line with this, Tamir (1975) traced three major elements of cognitive styles, first a general characteristics of the individuals; second a broad discipline-related element, which was up to now reflected mostly in the natural sciences and the last is a specific subject matter area Bachi and Uddin (1990) did in their study tattled: A study on cognitive preference of science secondary school teachers in India, where they compared how cognitive preference differs in groups of secondary school teachers identified by different curriculum taught, gender, length of teaching experience and educational qualifications, the

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results show that with few exceptions the overall pattern of cognitive preferences that emerged for all the groups is Recall-Principles, Application-Questioning. While, Inbar (1995) conducted his own in School Principal. His study is titled Cognitive Preferences of secondary school principals. The results of the study indicated that Relating and recalling information without considering its implications; relating to its practical application: posing critical questions about the information's validity; and relating to information according to the fundamental principles, he also found that school administrators were found to be different in their cognitive preferences as function of individual differences and different roles of school administration. Gibbs (2009) is of the view that thousands of studies have exploited gender difference in cognitive skills, male and female are similar on most and gender gap in math-related skills fluctuate based on the type of skills assessed and period observed, but, not all in psychological variables including cognitive skills (Hyde 2005), a study was conducted by Zhangy etal (2011) on identifying cognitive preferences for attractive female faces: an event related potential experiment using a study-test paradigm. 14 hetro sexual participant (age range 18-24 years, means average 21.67 years) were used to judge 84 attractive and 84 unattractive face images as either "attractive" or "unattractive". They were then asked to whether they had previously viewed each face in a recognition test in which 50% of the images were novel. The results of the findings revealed that, attractive female faces arouse more intense positive emotions in participants than do unattractive face, and they also represent reproductive fitness and mating value from the evolutionary perspectives.

It is obvious that cognitive preference make an impact on the students overall achievement, as mentioned by Novak (2009) that understanding cognitive preference aids the individual in better understanding history as well as the forces that help to shape the constellation of each culture, however there is the need to evaluate the learners performance which could serve as an important criterion for determining the success of curriculum (Muhammad 2009). Must of the researchers concentrated on cognitive preference were on one subject area (Biology, Chemistry, Physics Computer Science and Agriculture), of students and cognitive preference very few investigated cognitive preference science secondary schools, effects of ones age on cognitive preference, implication of the findings to curriculum development or teaching and learning, and they concentrated on either form four or five students, therefore, this study will fill this gap.
The summary the chronological areas researched based on the available literature on cognitive preference can be seen in the table below:

Name and Year	Area of Research
Heath, R.W., (1964)	"Curriculum cognition and educational measurement"
Marks L.H., (1967)	"CBS higher school chemistry and concept formation"
Dube, G.E., (1971)	"Cognitive Preference and interest of Chemistry Student in Secondary school"
Kempa, R,F and Dube, G.E (1973)	"Cognitive Preference Orientation in Students Chemistry"
Rogel, M., (1974)	"Achievement and Cognitive Preference Studies of Chemistry Students"
Tamir, P., (1974)	"Cognitive Preference and Achievement
Tamir, P., (1975)	"A note on Cognitive Preference in schools"
Brown, S.A., (1975)	"Cognitive Preference in Science their nature and analysis"
Tamir, P, and Lunetta, V.F. (1978)	"Cognitive Preference in Biology of group talented high school students"
Tamir, P, and Lunetta, V.F. (1978)	"Cognitive Preference. Across Discipline"
Tamir, P,.(1979)	"The Relationship Among Cognitive Preference School Environment, teachers Curriculum via and Submitters"
Jungwirth, E. (1980)	"Alternative Interpretation of Findings Cognitive Preference"
Messeng, L.Y (1980)	"Cognitive Preference of Malaysia Pre University Students in Chemistry"
Naught, M.C. (1982)	"Relation between Cognitive Preference and Achievement in Chemistry"
Joe, A.J. (1983)	"An exploratory study of Nigerian Students Cognitive Preferences in Biology"
Okebukola, P.A. (1986)	"A study of Relationship between Cognitive Preference and learning mode as determinant of meaningful learning through concept mapping"

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Tamir, P., (1988)	"The Relationship between Cognitive Preference Students background and Achievement in Science"
Akanbi, T. (1988)	"Cognitive Preference Instructional modes and Cognitive Development level and Achievement in Chemistry"
Abah, C.O.& Jegede, O.J. (1990)	"A Comparison of Cognitive Preference of science students at 3 levels of Education"
Wasagu, M.A. (1990)	"Attitude toward science schools as correlated with cognitive preference orientation"
Bachi, J.P. and Uddin, H. (1990)	'Cognitive Preference of Science Secondary School Teachers in India"
Wasagu, M.A. (1991)	"A study of Relationship between Cognitive Preference and attitudes towards Science"
In bar, D.E. (1995)	"The Cognitive Preference of school Principals"
Wasagu, M.A. (1998)	"Cultural belief Cognitive Preference and Achievement in Science"
Lim, K.C. (2008)	"The Cognitive Preference and ethnic Identity among Angola and native American high school students"
Novak, C.M. (2009)	Cognitive Preference and Ethnic Identity among Angola and Native American in high school students"
Muhammad, T. (2009)	"Integrated Science Cognitive Preference of Junior secondary school students"
Palaniappan, A.K. (2010)	"Figural Creativity and Cognitive Preference among Malaysian Undergraduate Students"
Caesar, A, and Reuven, L.B. (2010)	"Cognitive Preference and Critical Thinking skill of 11 Grade Biology Students"
Zhang, Y. etal. (2011)	"Identifying Cognitive Preference for Attractive Faces"
Muhammad, T.& Hano, J.L. (2011)	"Comparison of science and Non-science junior secondary school cognitive preference"
Mohammad, M. & Mckay, E. (2011)	"The effect of Cognitive Preferences and Prior knowledge on web mediated instruction"
Zhidong, D.Z (2013)	"Human gender and differences in Cognitive Preference towards attractive Faces"
Alwi, (nd)	"Attractive effects Between Cognitive Preference and Instructional strategies in Museum learning"

Discussion of Findings

A review of Cognitive Preference, cognitive styles, scientific achievement and their implications for curriculum development were conducted and reported from the available literatures, cognitive style and Cognitive Preference are considered as important factors in students' achievement. It was reported that Cognitive Preference aids individual in better understanding of scientific concepts, history as well as the forces that help to shape the constellation of each culture. It was indicated from the literature that Cognitive Preference and Cognitive styles were originated from two terms "cognition" and "style" (Gibbs 2009, and Sternberg etal 2014). These learning and thinking styles (Cognitive Preference and Cognitive Styles) differences exist among male and female as investigated by (Tamir 1988, Wasagu 1998, Ogunshola 1984, Abah and Jegede 1999, Muhammad 2009, Moore 2002, McCabe 2014, Zhidong 2013, Shojoe and Leila 2013, Hyde 2005) among others. The concept of learning styles describes individual differences in learning based on the learner's preference for employing differences of the learning cycle (McCabe 2014). From the literature Cognitive styles was described as an individual differences in approaches to tasks that can make a difference in the way which potentially in the efficiency with which a person perceive, learns or think (Andrew Bock 2001). While on the other hand it shows that Cognitive styles is refers to preferences for information processing or how knowledge is received and organised (Witkin 1977, Reissman 1966, Ogunshola 1988, Ahmad zade and Shojoe 2013).

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It was point out by Tamir (1981) that Cognitive Preference constitute a kind of Cognitive style which deal with attributes of special relevance to learning, is an internal unseen mode of individual that leads to exhibiting the cognitive styles which can be seen externally (Hath 1964). Cognitive Preference was in existing since 1960s, and from the literature it was indicated that Cognitive Preference was originally constructed by Heath 1964, who stated that, as we study Cognitive Preference our interest is not on weather student can identify correct or in correct information, but rather what he or she is likely to do with information intellectually, Heath (1964) Modes are: Recall (R), Application (A), Principle (P) and Questioning (Q). Cognitive Preference was studied mainly in relation to the learning science where they refers to the modes used by dealing with scientific information (Tamir 1981), evidences from the reviewed literature supported this because all the researches on Cognitive Preference were in in science disciplines (Biology, Physics, Chemistry, Computer science and Agriculture). However, from the literature it shows that different psychological theories point out that individual differs in their development, Piaget for example pinpoints four stages of development which are: Sensorimotor 0-2, Preoperational stage 2-7 years, Concrete operational stage 7-11 years and Formal operational stage 11/12+ years. From this it shows that this study would use Formal operational stage since ti will investigate Form six students who are at the age ranges between 18-21 years old. Finally, evidences from the literature indicated that cognitive styles/learning styles, cognitive preferences and scientific achievement has been investigated from different parts of the world among which are: United States (e.g., Rudolph 200, Novak 2009 & McCabe 2014), Saudi Arabia (e.g., Nuzhat etal 2013), Jordan (e.g. Alhajiya and Khresheh 2012), Australia (e.g. Pithers 2002 & McKay and Alwi 2011), Iran (Zade and Shojoe 2013), Israel (e.g. Tamir 1976, Tamir 1988, Inbar 1995, & Caesar and Reuven 2010), Malaysia (e.g. Palaniappan 1998, Zainol Abidin 2011, Messeng 1980, Mohammad and McKay 2011, Lim Kc 002, & Damavandi etal 2011), Ireland (e.g. Moore 2002), India (e.g. Bachi nd & Bachi 1990)), Taiwan (e.g. Chiou 2008), China (e.g. Sternberg 2014 & Shi 2011) and Nigeria (e.g. Okebukola nd Jegede 1988, Wasagu 1990, Wasagu 1991, Muhammad and Hano 2011 and Abah and Jegede 1990) among others.

Conclusion

From the reviewed literature it is clear that both cognitive preference and cognitive styles and Academic achievement were investigate from different countries, but despite all this efforts the research should have focus on the following areas: Most of researchers should have investigated the relationship between of cognitive preferences and scientific achievement, whether cognitive preferences can determines the scientific achievement of students, they should have indicated the implications of their findings to curriculum development and teaching and learning, which this research will try to do; It is obvious that cognitive preference make can make an impact on the students' overall achievement but, most of the researches concentrated on one subject area like Biology, chemistry Agriculture and Computer science, very few investigated cognitive preference and scientific achievement, this is a problem that need investigation frequently; there should have been a study from the literature on cognitive preferences and scientific achievement of form six science students and its implication to curriculum development in Zamfara State, Nigeria; The effects of ones age on cognitive styles were much investigated in cognitive style, but, few on cognitive preference, which this research would investigate; in contrast to the abundance of research on relationship between cognitive preference and Achievement, very few researchers have directly show the relationship between cognitive preference and science scientific achievement, which this study will investigate; many researchers have argue that cognitive preference is an important yard stick which show individual papered way of learning which can be a variable of studying new science curriculum but only few researchers shows the implications of their findings to curriculum development; age as an important determinant of student's achievement, most of the reviewed literature should have use age as one of the variables investigated in the areas cognitive preference and scientific achievement; research on conative styles and cognitive preference mostly carried out on either form four, five, undergraduate, teachers or principals but, there is no researchers conducted on cognitive preference and scientific achievement on Form six (SSIII) student, and from the reviewed literature most of the recent researches investigated cognitive styles/learning styles very few recent research carried out on cognitive preference, though, not in science and senior secondary school level (Form Six students). This study hope to bridge this gap, thus, Government should have created more Girls science secondary school in Zamfara state to close the gap of gender imbalance, as reported from the literature related to the cognitive preferences.

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Impact of National Health Policies on Maternal and Child Health Education Programs among Residents in Dutsin-Ma, Katsina State, Nigeria

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Abstract

This paper is investigated the impact of national health policies on maternal and child health education programs among residents in Dutsin Ma, Katsina State, Nigeria. The vulnerability and developmental needs of maternal and children health education programs in Nigeria necessitated the enactment of National Health Policies. However, there have been concerns about the effectiveness of this policy. This study investigated public perception on the performance of National Health Policies and healthcare for maternal and children in Dutsin ma Area of Katsina State. The study adopted mixed methods of data collection through questionnaire and In-depth Interviews. Using multistage, probability and stratified sampling techniques, the study selected 460 respondents from households, children, caregivers, educators and health workers. The social attachment theory anchored the theoretical explanation. The hypotheses were tested using logistic regression through the statistical package for social sciences version 27. The study revealed a pseudo-R^2 of 0.09 ($\chi^2 = 7.84$, $df = 6$, $p > 0.05$), indicating no significant improvement in maternal and child healthcare. Respondents reported low satisfaction with policy implementation in the study area, citing irregular immunizations, inadequate health screenings, limited skilled birth attendants, weak nutritional interventions, under-resourced facilities, hidden cost and poor service delivery. The study recommended a review of antenatal screening programmes, deploying skilled birth attendants at all hospitals, strengthening immunization logistics, revitalizing breastfeeding campaigns, and improving coordination of nutritional interventions to enhance policy effectiveness and child health outcomes in study area.

Keywords: National Health Policies, Maternal Program, Child Health Program

Introduction

National health policies directly influence the reach and effectiveness of maternal and child health (MCH) education by strengthening infrastructure, enhancing workforce training, and facilitating access to services. Effective policies that emphasize community-based approaches and integrated care improve immunization rates, antenatal care attendance, and nutritional knowledge. However, disparities in rural areas, inadequate funding, and inconsistent implementation often limit their total impact. In most countries of the world, including a considerable number of low- and middle-income countries, there is increasing interest in the use of more rigorous processes to ensure that healthcare recommendations are informed by the best available research evidence. This is supported by numerous scientific reports which have indicated that evidence from research can enhance health policy development by identifying new issues for the policy agenda, informing decisions about policy content and direction or by evaluating the impact of policy. The World Health Organization (WHO) in a previous report clearly indicated that better use of research evidence in development policy-making can save lives through more effective policies that respond to scientific and technological advances, use resources more efficiently and better meet citizens' needs (World Health Organization [WHO], 2004). In response to this global interest in evidence-to-policy process in the health sector, the Nigeria government recognized the importance of evidence-based health policy as a critical requirement for the improvement of the country's health systems. As part of the government's effort to promote and drive evidence-informed policy-making, the Nigeria Evidence-Based Health System Initiative (NEHSI) was established with the aim of building a responsive evidence-based health system, with emphasis on primary healthcare principally to improve

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maternal and child health outcomes. In a recent systematic review on maternal and child health interventions in Nigeria from 1990-2014, Kana and colleagues noted that poor maternal and child health indicators have been a recurring public health challenge in Nigeria since documentation of national maternal, newborn, and child health (MNCH) statistics began in the early 1990s. For instance, it is reported that each year in Nigeria, more than a quarter million neonates die, which translates to approximately 700 neonates every day. A number of previous studies have indicated that low birth weight, lack of antenatal care, maternal illness, mother's age, prematurity, and birth asphyxia are strongly associated with neonatal mortality in Nigeria. Regarding maternal health, out of 529 000 annual global maternal deaths, an estimated 52 900 Nigerian women die from pregnancy related complications, thus, a woman's chance of dying from pregnancy and childbirth in the country is 1 in 13. According to available reports, the main causes of maternal mortality in Nigeria are: haemorrhage (23%), infection (17%), unsafe abortion (11%), obstructed labour (11%) and toxaemia/eclampsia/hypertension (11%), Malaria (11%), anaemia (11%), and others including HIV and AIDS contribute about (5%).Other factors underlying maternal mortality include lack of awareness about complications in pregnancy and on the need to seek medical intervention early; lack of transportation to the health facilities where maternal healthcare can be provided; inability to pay for services, etc. (Federal Ministry of Health, 2007)). To address these MNCH challenges in Nigeria, the development and implementation of evidence-informed policies and promotion of initiatives such as NEHSI are very imperative. This is supported by the outcome of the systematic review of Kana and colleagues who noted that the development of evidence-based MNCH policies, implementation and publication of interventions corresponded with the downward trend of maternal and child mortality in Nigeria. However, despite the introduction of NEHSI and other similar initiatives such as the Nigeria independent accountability mechanism for MNCH, there is still insufficient interest and commitment on the part of policy-makers in transfer and uptake of research evidence into the health policy-making process in Nigeria (Uneke, 2010). To address effective National health policies, such as the National Health Policy and MNCH strategies, have improved access to maternal and child health education in Katsina State, there is a need for increased funding, better health infrastructure, improved training for health workers, and intensified, culturally appropriate community sensitization, particularly leveraging traditional leaders, to increase the impact of health education. Effective implementation of national policies requires addressing these structural and social determinants to improve the reach and impact of maternal and child health education programs in Katsina State.

Review of Literature

Maternal mortality, simply means women's death due to pregnancy and pregnancy related causes and it constitutes a major cause of death amongst women of reproductive age; thus, becoming one of the serious health issues particularly in developing nations. In addition, maternal mortality has been defined as death of women during pregnancy and or within 42days after termination of pregnancy. Maternal mortality ratio, on the other hand is referred to as the number of maternal deaths recorded annually per 100,000 live births. World's estimated statistics of maternal mortality ratio of 430 maternal per 1000 live births shows that developing countries had the highest ratios of 403 maternal deaths, while the developed countries had the lowest ratios of 27 maternal deaths. The World Health Organization (2012), reported that millions of women die globally every year due to complications related to pregnancy; 99% of these women are from the developing countries. The highest maternal mortality levels are found in parts of India, and sub-Saharan Africa, while the lowest level occurs in northern Europe with some parts of developed countries of the world (less than 4 per 100,000 births in Finland. Similarly, another study by Tinker, and Ransom (2002), indicated that maternal mortality ratio also varies between regions of the world for example it was reported that in Africa MMR is1 in 19, while in Asia the MMR is 1 in 132, Latin America has an MMR of 1 in 188 and while in developed countries the MMR is 1 in 2,976 and in northern Europe, the risk is as low as 1 in 4000. Nigeria, with a population of over 80.2 million women as at 2006 census and that about 49% representing 54 million women lived in rural areas, is one of the countries in sub- Saharan Africa with the highest records of maternal mortality ratio. However, despite its efforts to tackle the twin problems through the formulation and implementation of various health policies, it was estimated that about 545,000 to 600,000 women died annually due to pregnancy related causes in Nigeria. This constitutes about 10% world's maternal deaths births (Nursing World Nigeria, 2013). Maternal mortality, is caused by both direct factors and indirect factors. The direct factors include obstetrical complications such as hemorrhages, infections, abortions performed by unqualified health personnel, eclampsia, and prolonged labor. While, the indirect factors of maternal mortality include: diseases and infections such as malaria, HIV/AIDS, hepatitis, and anemia. Similarly, WHO, (2008), reported that 80% of maternal death in the world, are caused by factors such as severe bleeding,

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infections, eclampsia, and prolonged labor. Other factors responsible for maternal death include factors such as medical factors, health factors, reproductive factors, unwanted pregnancy, and socio-economic factors (Mojekwu, 2012). Nigeria's health care services are delivered through a complex, integrated, and decentralized health system under the control of the three tiers of governments – federal, state, and local government. Based on the integrated health care systems, the federal government is responsible for co-ordination and implementation of national health policies. It also, supervises health activities in the 36 states of the federation and the federal capital territory, Abuja, as well as the 774 local government areas. It is also responsible for providing tertiary health care through the teaching hospitals and federal medical centers established across the country. The state government on the other hand is responsible for providing secondary health care services through the state hospitals and comprehensive health centers. The local government is responsible for providing primary health care services through primary health care centers, established across the local government headquarters and some major towns and villages. This arrangement requires some measure of cooperation and coordination between the three tiers of governments and other agencies. Unfortunately, this arrangement often results in duplication and overlap of responsibilities, conflict, and waste. Other health service providers include, private and non-profit, as well as community-based health organizations also provides health care services in Nigeria.

Health care system in Nigeria is financed through a combination of sources – revenue collected from tax payers, contribution from donor agencies such as WHO, UNICEF and USAID user fees charged patients, and National health insurance scheme which was established in 2005 by Decree 35 `of 1999. In Nigeria, the federal government provides over 90% of the funds used by health system, while the states and local governments provide the 10%. The federal government allows the state government and local government, a lot of discretion in the way they managed and disbursed the allocated funds from the federal government, under the integrated healthcare system (Scott, 2010). However, the level of funding provided by the three tiers of government to the health sector over the last three decades or so, have been inadequate and far below the United Nations recommended figure of 15% of national annual budget of UN member countries. But, it must be pointed out that Advocacy groups have continued to provide financial supports to poor developing countries like Nigeria to improve their health systems because of their inability to strengthen their health systems due to poor funding. For example, it was reported, that the Global Fund for AIDS, Tuberculosis, and Malaria (Global Fund), Bill and Melinda Gates Foundation initiatives had contributed $48 billion to research, care, prevention, and treatment of HIV within five years in developing countries including Nigeria. Similarly, a study conducted in Nigeria also revealed that NGOs and other international donor organizations had made significant financial contributions of $ USD 32,479 Million and $ USD 45,477,907.00 in 2007 and 2008 respectively towards converting HIV/AIDs in Nigeria. Various criteria are used to evaluate a country's healthcare system to determine its efficiency and effectiveness with regards to healthcare services delivery. Some of these criteria include goals achievements, distribution coverage of the health services, quality of the services provided and then equity demonstrated when delivering the services to the citizen. However, the performance of the Nigerian healthcare system has been low due to several policy implementation problems. Some of these problems include untimely disbursement of funds, limited institutional capacity, corruption, and unstable political and economic environment (Adinma, 2010). Other factors which affected the performance of the Nigerian health system performance was its low coverage of beneficiaries, despite the introduction of national health insurance scheme (NHIS) in 1999. This was because as at the year 2012, the scheme achieved only about 3% coverage of the Nigerian population (i.e. only five million people) cover aged with mixed results, insufficient health staff, inability of local governments to provide the primary health care with necessary equipment and drugs, socio-cultural and socio-economic factors, which hindered access health care particularly in rural areas, where majority of the population live on an average earning of ratio 1.90 dollar per day. These were some of the reasons that necessitated the introduction of the 2004 Nigeria's health policy. According to Abdulraheem, et al. (2012), the main clause of the 2004 National Health Policy is to invigorate and improve the Nigerian health system to provide effective, efficient, quality, accessible and affordable health services by achieving the following health targets: to decrease by 66%, from 1990 to 2015, the under-5 mortality rate; to decrease by 66%, from 1990 to 2015 maternal mortality rate; to cut down by 2015 and reverse the spread of HIV/AIDs; to have halted by 2015 and begun to reverse the incidence of malaria and other major diseases.

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Methodology

This study adopted a cross-sectional survey design to evaluate the efficiency of the National Health Insurance Scheme (NHIS) on maternal health in Dutsin Ma, Nigeria. This design was appropriate for assessing prevailing trends and relationships without manipulating variables, thus providing a snapshot of the current state of maternal health service utilization under NHIS. The target population comprised households within Dutsin Ma Metropolitan. The selection of these neighborhoods was strategic, aimed at capturing a comprehensive understanding of maternal healthcare access and the efficiency of the National Health Insurance Scheme (NHIS) across varying socio-economic groups and geographic locations. The study focused on collecting data related to NHIS coverage, frequency of antenatal visits, and distance to healthcare facilities. A random sampling technique was employed in this study to ensure that every household within the selected communities of Jos North had an equal chance of being included in the survey. By allowing for a fair distribution of respondents across different socio-economic and geographic segments, the method supported the collection of reliable data related to NHIS coverage, antenatal visits, and proximity to health facilities. The study utilized a rigorously developed questionnaire to collect primary data from respondents across selected Wards in Dutsin Ma, ensuring a fair and unbiased representation of the target population. Participants were selected through a random sampling method to capture diverse maternal health experiences among households in the study area.

Objectives

The main objective of this paper is to assess the impact of national health policies on the effectiveness and reach of maternal and child health education programs among the residents of Dutsin Ma, Nigeria. The following are the objectives of the study:

1. Access the effect of national health policies on maternal health education programs among the residents of Dutsin Ma, Nigeria.
2. Evaluate the impact of national health policies on child health education programs among the residents of Dutsin Ma, Nigeria

Hypotheses

The following hypotheses were postulated to guide the study and were tested at a 0.05 level of significance:

Ho_1: There is no significant differences between national health policies and maternal health education programs among the residents of Dutsin Ma, Nigeria.

Ho_2: There is no significant differences between national health policies and child health education programs among the residents of Dutsin Ma, Nigeria.

Presentation of Findings

The study selected 460 respondents from households for quantitative data. The social attachment theory anchored the theoretical explanation. Quantitative data were analyzed descriptively and inferentially while qualitative data were transcribed through content analysis.

Descriptive Analysis

Table 1: Socio-demographic Characteristics of Respondents

Category	Frequency	Percent (%)	P-value
Age Group			
Less than 18 years	15	3.	
18–25 years	57	12.6	
26–35 years	121	26.7	
36–45 years	132	29.1	0.0013
46–55 years	82	18.1	
56 years and above	46	10.2	
Gender			
Male	181	39.9	
Female	272	60.1	0.009

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Marital Status			
Married	253	55.8	
Single	89	19.6	
Widowed/Widower	42	9.3	0.025
Divorced/Separated	69	15.2	
Occupation			
Employed	150	33.1	
Self-employed	125	27.6	
Unemployed	50	11.0	0.152
Student	75	16.6	
Retired	25	5.5	
Children under 5			
Yes	301	66.4	
No	152	33.6%	0.002

The first compartment of table 1 shows the age distribution of respondents which indicates that most participants were aged between 26 and 45, aligning with the active parenting stage, thereby enhancing the reliability of feedback on early childhood services. The second compartment displays the gender of respondents. The higher number of female respondents, who are often primary caregivers, implies that the study reflected the experiences of those most directly engaged with child healthcare, education, and protection services. The third compartment depicts the marital status of the respondents. A significant proportion of respondents were married, suggesting familiarity with family-focused policies, while responses from single parents and other family structures offered diverse perspectives.

The fourth compartment shows the occupation of respondents, the majority were employed or self-employed, indicating economic engagement and possible awareness of public policies. Inclusion of unemployed individuals, students, and retirees provided a more inclusive understanding across socioeconomic strata. The fifth compartment displays data on respondent number of children under 5, Importantly, most respondents had children under five, grounding their insights in lived experience with the IECD policy's target population. Collectively, these demographics strengthen the credibility and applicability of the study's findings.

Regression Analysis

Table 2: Logistic Regression Analysis on National Health Policies and Improvement of Adequate Healthcare for Children and Maternal Women in the study area

Model Statistic	**Values**
Number of Observations	453
Pseudo R^2	0.09
Log-Likelihood	-140.89
Chi-Square	7.84
Degrees of Freedom	6

Variable			**Z-score**		**P-value**
	Regression Coefficients				
Coefficient	Std. **Error**	Odds **Ratio**			
Intercept	-0.650	0.470	-1.380	0.522	0.167
Level of Policy Implementation	0.480	0.590	0.810	1.616	0.418

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Health Screening for Pregnant Women	0.530	0.610	0.870	1.698	0.385
Skilled Birth Attendants	0.590	0.640	0.920	1.803	0.357
Consistent Immunization Programs	0.610	0.580	1.050	1.840	0.293
Promotion of Exclusive Breastfeeding	0.450	0.600	0.750	1.568	0.451
Salt Iodization & Iron Fortification	0.390	0.560	0.700	1.477	0.484
Malaria Prevention Measures	0.520	0.590	0.880	1.682	0.378

The logistic regression analysis examined the impact of national health policies on the effectiveness and reach of maternal and child health education programs among the residents of Dutsin Ma, Nigeria. The model summary revealed a relatively low explanatory power, with a Pseudo R^2 value of 0.09 and a log-likelihood of -140.89, indicating that the independent variables included in the model do not substantially explain variations in the dependent variable. The Chi-square statistic of 7.84 with 6 degrees of freedom is statistically insignificant, suggesting the overall model is not a strong fit. Furthermore, none of the independent variables demonstrated statistically significant effects. All p-values for the predictors including level of policy implementation, health screening for pregnant women, availability of skilled birth attendants, consistent immunization programmes, exclusive breastfeeding, salt iodization and iron fortification, and malaria prevention measures exceeded the 0.05 significance threshold. This indicates that none of these policy components significantly predicted improvement in children's healthcare in the study area. Based on this outcome, the null hypothesis (H_o1) and (H_02), which states that the IECD policy has not significantly improved adequate healthcare for children in Dutsin Ma, Nigeria, is accepted. The findings imply that the implementation of the national health policies policy has not yielded measurable improvements in child healthcare delivery within the local context.

Discussion of Findings

The study examined whether the national health policies has improved access to healthcare for maternal and children in Dutsin Ma, Nigeria. The findings revealed that the policy has not produced any measurable progress in healthcare delivery for children across the area. Logistic regression results demonstrated that all healthcare variables assessed, including health screening for pregnant women, skilled birth attendance, consistent immunizations, exclusive breastfeeding promotion, salt iodization, iron fortification, and malaria prevention measures, did not yield statistically significant effects on the adequacy of healthcare. Respondents' experiences further confirmed these results, as many described persistent challenges with poor service delivery, irregular schedules, and resource shortages.

This suggests that the intentions behind the policy have not translated into meaningful improvement in practice. In contrast to Ndemeke (2024), who documented positive outcomes such as better antenatal screening and reduced maternal and infant mortality, respondents in this study shared their disappointment about the limited reach and reliability of these services. Many emphasized that antenatal screening was inconsistent and not available in many rural communities, making it difficult for pregnant women to benefit from early healthcare interventions. Although Zubairu (2024) reported that immunization programmes had become more reliable and that awareness of breastfeeding had improved in their studies, most respondents in this research described a very different reality. Many reported irregular immunization schedules, shortages of essential drugs, and even non-functional clinics, which placed children at risk of missing important vaccinations. Health education campaigns were said to occur mainly in urban centres, leaving rural populations uninformed and underserved. Furthermore, while Bassey and Amah (2023) identified some positive outcomes from nutritional interventions such as salt iodization and iron fortification, respondents in this study lamented that they had not received any supplements or fortified foods through public healthcare services. This gap reflects a critical absence in efforts to address child malnutrition. The findings also challenge the claims of Oghene and Udom (2024) that malaria prevention measures, including the distribution of mosquito nets, had reduced child mortality. Participants from Makurdi stated that such interventions were irregular, poorly coordinated, and often unavailable in their communities, leaving many families vulnerable to preventable illness. These experiences reflect frustrations over the inconsistency of healthcare interventions and their weak reach at the local level. These findings raise important questions about the practical application of Social Attachment Theory within the current healthcare policy environment. The theory suggests that secure attachment depends

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on consistent and nurturing caregiving environments that protect and support children's development. For this to occur, reliable access to maternal and child health services is crucial. However, the fragmented and irregular delivery observed in Dutsin Ma, Nigeria prevents caregivers from providing such steady care. The absence of dependable immunization programmes, maternal health services, and prenatal care leaves children exposed to risks that could otherwise be managed. As a result, children are deprived of the stable foundations required to build secure attachments, undermining their physical and emotional well-being.

Conclusion

The study examined the national health policies and improved adequate healthcare for maternal and children in Dutsin Ma, Nigeria. The aim was to assess the effect of key components of the policy, such as maternal health screening, skilled birth attendance, immunization, breastfeeding promotion, nutrition interventions, and malaria prevention. The findings revealed that the policy has not brought about measurable improvements in healthcare delivery for children. Both quantitative results and respondents' experiences pointed to persistent challenges. Healthcare remained largely inaccessible, unreliable, and unaffordable, with irregular immunization schedules, limited maternal health services, weak nutritional support, and overstretched staff. These realities indicate that the policy has not been effectively translated into meaningful practice. The study thus concludes that the national health policies has not achieved its intended goal of improving healthcare for maternal and children in Dutsin Ma, Nigeria. The evidence shows that children and their caregivers still face critical barriers that compromise health outcomes. Accessibility is undermined by uneven service delivery, reliability is weakened by irregular supply and staffing shortages, and affordability remains a persistent burden despite claims of free care. These findings imply that structural weaknesses and poor implementation strategies have prevented the policy from making a tangible difference. The implication is that early childhood healthcare in Makurdi remains fragile, leaving children vulnerable to preventable risks and denying them the secure foundations necessary for healthy development.

Recommendations

Based on the findings of this study, the following are recommended:

(i) The government should conduct a thorough audit of antenatal health screening initiatives under the national health policies, especially in underserved rural areas, to identify systemic bottlenecks and redesign strategies for more inclusive and consistent access.

(ii) There is a need to urgently address the shortage and uneven distribution of skilled health personnel by government. Priority should be given to deploying well-trained birth attendants to remote health centres, with incentives to retain them in hard-to reach the study area.

(iii) Immunization programmes should be strengthened by resolving logistical delays, ensuring availability of vaccines, and establishing mobile outreach units to serve remote and underserved communities.

(iv) Breastfeeding campaigns must be revitalized through grassroots sensitization, regular follow-up, and culturally appropriate education, especially in rural areas where awareness and adoption remain low.

(v) Existing salt iodization and iron fortification initiatives require better coordination, transparency, and community-level delivery mechanisms to close the gaps in coverage and impact observed across Dutsin Ma, Nigeria

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Effect of Animal Traction Technology on Medium-Scale Maize Farmers' Livelihood in Kaduna State, Nigeria

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Abstract

The study analysed the effect of Animal Traction Technology (ATT) on medium-scale maize farmers' livelihood in Kaduna State, Nigeria. Cross-sectional survey design was adopted with multi-stage sampling procedure used to select 309 respondents out of 1573 medium-scale maize farmers across the four agricultural zones in Kaduna State. A structured questionnaire was used as instrument for data collection. The instrument was validated, pilot-tested giving a standardized reliability coefficient of 0.874. The instrument was administered to the respondents. Data collected was analysed using descriptive statistics in the form of frequency, percentages, mean and standard deviation. Logit regression analysis was used to test the null hypothesis. The finding showed that ATT in Kaduna State significantly affects maize farmers' livelihood ($p = 0.000 < 0.05$). It was concluded that the life of medium-scale maize farmers was better after the use of ATT. The study recommends among others the need for Kaduna State Agricultural Development Agency (KADA) to integrate ATT into broader its livelihood improvement programmes to enhance the income and food security of farmers in the State.

Keywords: Animal Traction Technology, Medium-Scale Maize Farmers, Livelihood

Introduction

It has been reported in many parts of the world that farmers have adopted various methods of improving agricultural productivity to meet the numerous demands of life. Among the adopted technologies were; crop rotation, conservation tillage, mechanisation, and the use of animal traction. While these technologies have significantly enhanced farming efficiency, animal traction remains one of the oldest yet most reliable techniques, especially in regions where mechanization is limited. Animal traction entails the use of animals to pull farm equipment, vehicles, and other loads to aid farmers in carrying out various tasks on the farm. The most common draft animals include cattle, oxen, mules, buffaloes, donkeys, and camels (Hafiza, 2020). In many developing countries, including Nigeria, Animal Traction Technology (ATT) as a subset of agricultural mechanization, has long been used for transportation as well as cultivation, harrowing, ploughing, and weeding, the role of which cannot be over-emphasized. The use of ATT for crop production gives room for increased production capacity and improved livelihoods of the farmers (Umar *et al*, 2021). They have been used to increase work efficiency, reduce drudgery, cost of labour and save time that can be used for other productive or socially important tasks.

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The experience in Nigeria on the use of animal traction is that many regard animal traction as a backward technology. However, experience from Kaduna State increasingly sees animal traction as an economically and ecologically appropriate technology that is highly relevant and adopted by the rural farmers. In this regard, the animal traction system commonly practiced can be grouped into five components: the animals, the harness, the implement (plough, harrows, ridges, and cart), the operator, and the soil or load. These components are integral to animal traction but demand different specialties to deliver a holistic output. The ATT operators primarily use the animals on their farms and provide services to neighbours on a hiring basis for cash or in kind. The adoption of ATT is about 6.6% and this is termed a low adoption level (Mboungbo *et al*, 2018). These ATT users cultivate variety of labour and capital-intensive crops such as maize and has increased farmers' profitability and improve their livelihood.

Livelihood is seen as a set of activities in everyday life conducted over one's life span. These activities among others are; securing water, food, fodder, medicine, shelter, and clothing. The individual's livelihood involves the capacity to acquire enough income to satisfy the basic needs of their households through increased productivity (Nathaniel, 2021). A livelihood is considered sustainable if it can withstand stresses and shocks, recover from them, and retain or improve its capacities, resources, and activities in the present and the future without compromising the natural resource base (Natarajan *et al*., 2022). Farmers can use their livelihood capital and deploy the best strategies to increase their livelihood and, in this instance, maize farmers use ATT as a tool for sustainable maize production and livelihood. According to the United States Department of Agriculture (USDA, 2023), Nigeria's maize production for the 2023/24 marketing year (MY) is estimated at 11.8 million metric tonnes (MMT), representing a 7.3 percent decline from the 12.735 MMT recorded in 2022/23, primarily due to escalating insecurity, high input costs, and communal violence in key production regions in the North. Despite this output, a significant food deficit persists, as annual maize consumption is projected at 12.3 MMT, outpacing domestic production. Consequently, maize imports are forecasted to rise to 150,000 MT, a 50 percent increase over the previous year, as the government considers limited waivers to mitigate food shortages, despite the Central Bank of Nigeria's restriction on corn importation (USDA, 2023). Despite advancements in agricultural technologies, such as high-yielding crop varieties and agro-chemicals, maize production remains insufficient for huge export (Kamara *et al*., 2020). Mechanized farming, though efficient, is costly and faces challenges like high maintenance and limited spare parts, prompting farmers to adopt ATT as a supplementary measure. While ATT adoption among medium-scale farmers in Nigeria is growing, its full potential remains underutilized, and its impact on livelihoods is not well understood and much documented in the area. This research analysed the effect of ATT on medium-scale maize farmers' livelihood in Kaduna State, Nigeria. Specific objective of the study is to determine the socio-economic characteristics of medium-scale maize farmers and asses the effect of ATT use on their livelihood.

Hypothesis

H_{o1}: Animal Traction Technology has no significant effect on medium-scale maize farmers' livelihood in Kaduna State.

Conceptual framework

A conceptual framework is a tentative theory about the phenomena being studied that informs the entirety of the study's design, noting that this may also be called a 'theoretical framework (van der Waldt, 2024). The conceptual framework comprises your thoughts on the identification of the research topic, the problem to be investigated, the questions to be asked, the literature to be reviewed, the concepts to be applied, the methodology used, procedures and instruments, the data analysis and interpretation of findings, recommendations, and conclusions that will be made. Accordingly, the conceptual framework is the logical conceptualization of your entire research project. A conceptual framework can be simply put as a diagrammatic representation of how the concepts underpinning the study relate to one another. In this study, it is expected that animal traction will result in to change in maize farmers' livelihood through increased yield of crop and standard of living of medium-scale maize farmers. It is assumed that maize farmer's socio-economic characteristics, such as age, gender, education, farmer's experience, and technological factors such as improved seedling and animal traction will be the independent variables that will bring about changes in the farmer's active behaviour using ATT and their livelihoods.

Literature Review

Gona and Mohammad (2019) conducted a study that examined the role of ATT on the profitability and income of small-scale farmers in Kebbi State, Nigeria. Primary data were collected through the use of pre-tested questionnaires in 2017. A

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multistage sampling procedure was used to collect data from two categories of respondents who are ATT users and non-users. Data were analysed using descriptive statistics, net farm income analysis, and gini co-efficient. The result showed that bull (100%), camel (60.26%), and donkey (32.05 %) are the various types of animals used as draught animals in the study area. The result further reveals that ploughing (100%), ridging (98.72%), tillage (97.44%), weeding (88.46%), transportation (65.38%), and fetching of water (12.82%) are the activities performed using draught animals. The result revealed that farmers who are ATT users outperformed farmers who are non-ATT users when using Net Farm Income analysis. Farmers who are ATT users achieved a Net Farm Income of N436,885.36 and non-users achieved about N150,365.38 which shows a significant difference of about N286,519.98. This suggests that ATT users achieved more profit than the non-users. The study was found useful to the on-going study because they both assess the effect of ATT and use descriptive statistics to answer all research questions. Furthermore, a multi-stage sampling procedure was used to draw the desired sample size for both studies. The on-going study is different from the previous study as the previous study examined ATT on the profitability and income of small-scale farmers in Kebbi State whereas the current study evaluated the effect of ATT on livelihood of medium-scale maize farmers in Kaduna State.

Suad, Omeima, and Ezdehar (2022) conducted a study on factors affecting the adoption of animal traction by farmers (west and south Kordofan state) in Sudan. The study used two types of questionnaires one for the farmers who used hand tools and the other for the farmers who used ATT, a sample of 400 farmers, was selected following the systematic random sampling technique on geographical location. The questionnaire data was analysed using the Statistical Package for Social Science (SPSS) to produce graphs, frequency, and percentage tables, and the different parameters were assessed using chi-square test. The results showed that different factors have effects on animal traction adoption, the factors include (age, gender, education, animal type, crop, farm size, land ownership, tools, and extension) and mentioned that there are significant associations between animal traction and these factors. More than half of the respondents 55% educational level (year and education before university). Horses are dominant in West Kordofan and Cows\Oxen are used only in South Kordofan presented by 20% of respondents. Most of the farmers 70% owned land, 40% of the farmers used plough for ploughing, and 50% used hand tools. All extension services concentrated on distributing improved seeds besides farmer visits and ignored other methods and means of extension. The study concluded that extensions in the targeted area were introduced to the farmers poorly, all extension services concentrated on distributing improved seeds besides farmer visits and ignored other methods and means of extension. The study also concluded that land and animal ownership present a major effect on animal traction adoption, the farmers who owned land and animal adopts animal traction more than farmers who do not own land and animal. The study was found relevant to the on-going study as both are on animal traction and use descriptive statistics of frequency and percentages to answer the research questions. The current study differs from the previous study as the previous study used two questionnaires to generate information from the respondents while the current researcher used a researcher-designed questionnaire to collect data from the respondents. Furthermore, the previous study was on factors affecting the adoption of ATT in Sudan while the current study is on the of effect of ATT on livelihood of medium-scale maize farmers in Kaduna State, Nigeria.

Methodology

The study employed a cross-sectional survey design to gather data at a specific point in time, enabling the researcher to make inferences about the population of interest. This design was chosen because it allows for efficient collection of data on multiple variables within a short timeframe, making it suitable for describing characteristics and relationships among different variables. The population of the study consisted of 1,573 registered medium-scale maize farmers using animal traction, distributed across the four agricultural zones in Kaduna State. A stratified sampling was used to group medium-scale farmers in Kaduna State into the already existing four (4) agricultural zones, namely Maigana, Lere, Samaru, and Birnin-Gwari. Purposive sampling was used to select three (3) agricultural zones which are Maigana, Lere, and Birnin-Gwari, and proportionate sampling techniques was used to select 309 medium-scale maize farmers in the selected zones. Primary Data was collected using structured questionnaire, written in English language and translated into the local language of the area (Hausa) during data collection. The instrument was validated and tested to ensure its accuracy and reliability. The reliability of the instrument was assessed using the split-half method, which yielded a Cronbach alpha of 0.706 and 0.802 for the two halves, with a correlation coefficient of 0.874. Data was analysed using descriptive statistics and logit regression model. The descriptive statistics, including frequencies, percentages, mean and standard deviations,

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were used to answer the research questions. While the logit regression analysis was employed to examine the relationships between the independent variables (socio-economic characteristics, institutional factors, technological factors, and productivity) and the dependent variables (income, asset possession, household expenditure, and wage-earning opportunities) at 0.05 level of significance.

Presentation of Results

Table 1: Distribution of medium-scale maize farmers by their socio-economic characteristics (N = 309)

Variable	Respondents' type	Frequency	Mean	Percentage	Std. Dev
Age (years)			47.57		0.5749
Sex	Male	263		85.1%	
	Female	46		14.9%	
Educational level	No formal education	14		4.5%	
	Quranic education	21		6.8%	
	Primary education	119		38.5%	
	Secondary education	79		25.6%	
	Tertiary education	58		18.8%	
	Adult literacy	18		5.8%	
Farm size (ha)			2.56		0.1269
Household size			6.9		0.2132
Farming experience (yrs.)			16.98		0.5932
Membership of farmer associations	Yes	193		62.5%	
	No	116		37.5%	
Access to Credit	Yes	103		33.3%	
	No	206		66.7%	
Sources of credit	None	206		66.7%	
	Commercial banks	14		4.5%	
	Bank of Agriculture	20		6.5%	
	Money lenders	30		9.7%	
	Friends/Relatives	39		12.6%	
Extension contact	Yes	187		60.5%	
	No	122		39.5%	

Table 1 indicated that the average age distribution of the respondents was 48 years. This finding showed that the medium-scale maize farmers in the study area were in their agricultural productive age. This is in line with the work of Owolabi, Ajayi and Oyeyemi (2018) who found that most farmers in northwestern Nigeria were within the age bracket of 40-49 years. Furthermore, the results indicated that male respondents dominated medium-scale maize farming comprising of 85.1%. This is in agreement with the work of Ayodele *et al.* (2020) and Ja'afar-Fur *et al.* (2024) whom revealed that maize farming is male-dominated activity due to its high labour and cost demand. The educational level of the respondent showed that the majority had a low level of education, with most having primary school education (38.5%) only. Education is an important index for the adoption of agricultural technologies, and it is expected that farmers with a high level of education or some form of literacy would accept new technologies more easily and quickly. This finding aligns with the finding of Bello, Frederick, Nazeer and Ibrahim (2020) who conducted a study on the Profitability of Small-Scale Maize Production in Nigeria: A Case Study of Bichi Local Government, Kano State, Nigeria. The average mean farm size of the medium-scale maize farmers in the area was 2.56 hectares, indicating that most of the farmers owned about 3 hectares of land for maize cultivation. Farmers with large holdings were more likely to take risks with complex technologies than those with small holdings, which showed that the respondents in this study were more likely to adopt the use of ATT without any apprehension. The finding is also consistent with the work of Fadeyi, Ariyawardana and Aziz (2022) who found that small-scale farmers in Nigeria. However, landholding sizes may vary slightly depending on the scale of farming. The mean household size of the respondents was about 7 persons per household. The average household size of 7 members is not in line with findings from Owolabi et al. (2016), who reported a mean household size of 11 persons per household head, indicating that larger households are common in rural agricultural settings. Results on membership in farmer associations also showed that the majority of the respondents (62.5%) belonged to farmers' organizations in the area. However, the

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finding that most farmers belonged to cooperative societies negates the finding of Omotilewa, Jayne, Muyanga, Aromolaran, Liverpool-Tasie and Awokuse (2021) who found that only a small percentage of farmers in Nigeria, were members of cooperatives. This discrepancy could be due to regional differences in the prevalence and effectiveness of cooperative societies. In Kaduna State, cooperatives may be more established or actively promoted by local governments or Non-Governmental Organizations, leading to higher membership rates among farmers. Further results from the table shows that the majority (66.7%) of the farmers did not have access to credit, among those who had access to credit, the most common source was friends and relatives (12.6%). suggesting a reliance on informal financial networks. Institutional sources such as the Bank of Agriculture (6.5%) and commercial banks (4.5%) were less frequently utilized, possibly due to stringent loan requirements, high interest rates, or lack of collateral. The farmers without access to credit highlighted a potential constraint on agricultural productivity, as limited financing restricted investments in improved farming inputs, technology, and expansion efforts. The is consistent with the finding of Zantsi and Bester (2019), who highlighted the financial constraints faced by smallholder farmers in South Africa. Similarly, Balana and Oyeyemi (2021) found that access to credit and other financial services was a significant barrier to the adoption of animal traction technology in Nigeria. This suggests that financial constraints are a widespread issue affecting farmers' livelihoods across different regions.

Table 2: Estimated assets of medium-scale maize farmers (N = 309)

Variable	Mean	Standard deviation (std)
Income generated	₦3,629,882.18	16.4301
Household assets possession	₦2,414,592.52	13.9332
Household expenditure	₦1,253261.37	13.4284
Wage earning opportunities	₦451,684.92	9.4211

The result in Table 2 shows that the average mean income of medium-scale maize farmers before using ATT was ₦3,629,882.18 due to the use of ATT, the standard deviations showed a significant variation among the farmers. An indication that maize farmers earnings is relatively high. The result also showed that the farmers are relatively endowed (₦2,414,592.51) when in terms of possession of fixed assets in the form of livestock, machinery and consumer durables. On the other hand, household expenditure among the respondents summoned to about ₦1,300,000, this shows that household expenditure constitutes a major share of the farmers income in the study area. There is an indication of low livelihood diversification among the farmers as wage earnings is only ₦451,684.92 in the study area.

Test of hypothesis: Animal Traction Technology has no significant effect on medium-scale maize farmers' livelihood in Kaduna State, Nigeria.

Table 3: Regression estimates showing the effect of ATT ownership on medium-scale maize farmers' livelihood

Variables	Coefficient	t
Age	-8153.33**	-2.61
sex	-14776.32***	-3.53
Level of education	-15432.65***	-5.00
Household size	-25432.50***	-8.43
Farm size	24369.79***	5.53
Years of experience	4891.179***	4.08
Access to credit	31838.33****	3.53
Do you own the ATT	-19531.63***	-3.33
Membership of cooperative	-147416.8***	-13.23
Seeds (kg)	-7518.503***	-4.35
fertilizers	61580.50***	8.91
Agrochemicals	-2185.527***	-20.82
Source of labour	-24029.53***	-6.22
Access to extension contact	2871.661	0.64
Do you use ATT to cultivate your maize	2245.894***	4.21
Level of income after using ATT	2078.072***	3.08
Constraint to ATT Usage	-219672.5***	-7.16
R^2	0.9797	

Source: Field survey (2024) *** significant at 1% and ** significant at 5%

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Estimated result for establishing a relationship between maize output and ATT ownership are presented in Table 3. The result of the analysis reveals that the estimated R^2 (0.9797) shows that 97.97% of the variation in the dependent variable (medium-scale maize farmers' livelihood) has been predicted by the independent variables. This high value reflects a strong goodness-of-fit for the regression model. Among the socio-economic variables, age had a negative and statistically significant coefficient (-8153.33) at the 5% level, implying that as farmers grow older, their livelihood (as proxied by production or income) declines, possibly due to diminishing physical ability and adoption of technology. This is in agreement with the work of Ja'afar-Furo *et al*. (2020) who carried out a study on the Analysis of Socio-economic Factors Affecting the Adoption of Improved Maize Varieties among Rural Communities, in Adamawa State, Nigeria. It was stated that the majority of the maize farmers (73.4%) belong to the middle age group. Whereas 8.16 percent belong to old age and 2.04 percent belong to young age. This is in agreement with the work of Ayodele *et al.* (2020) which revealed that maize farming is male-dominated with 87 percent of the respondents being men. Sex was also negatively significant (-14776.32), indicating that female farmers may be at a disadvantage in terms of productivity or benefits from ATT, likely due to gender-based disparities in access to resources.

Level of education and household size had strong negative effects on livelihood, both significant at the 1% level. While education is typically expected to have a positive influence, its negative coefficient (-15432.65) could suggest a mismatch between formal education and practical farming skills, or perhaps that more educated individuals are less engaged in hands-on farming. This negates the work of Bello, Frederick, Nazeer and Ibrahim (2020) who conducted a study on the Profitability of Small-Scale Maize Production in Nigeria: A Case Study of Bichi Local Government, Kano State-Nigeria. It was reported that 33.3 percent of the respondents finished primary school, 16.67 percent of them finished secondary school, and only 3.3 percent of them have tertiary education while the majority (46.7%) have a non-formal education. The negative impact of household size (-25432.50) may reflect higher dependency burdens reducing available labor or productive input per household member. Conversely, farm size (24369.79), years of farming experience (4891.18), and access to credit (31838.33) all had positive and significant effects, reinforcing the importance of productive assets, expertise, and financial capacity in improving livelihood outcomes. These findings suggest that larger, more experienced, and better-financed farmers are more likely to benefit from or effectively utilize ATT.

The variable "Do you own the ATT" was significant and negative (-19531.63), which may initially appear contradictory to expectations. However, this might indicate that merely owning the ATT does not translate to higher productivity unless effectively used or supported by other factors (like training or infrastructure). In contrast, "Do you use ATT to cultivate your maize" was positively significant (2245.894), highlighting that actual utilization rather than ownership is what contributes positively to livelihood outcomes. Interestingly, "level of income after using ATT" also had a positive and significant effect (2078.072), which validates that ATT usage can improve financial outcomes, likely by enhancing productivity. However, constraints to ATT usage had a large negative impact (-219672.5), underscoring those challenges like cost, accessibility, or technical difficulties can severely undermine the potential benefits of ATT. Other notable findings include significant negative effects from inputs such as seeds (-7518.50), agrochemicals (-2185.53), and source of labor (-24029.53). These could indicate inefficiencies or high costs associated with these inputs. Conversely, fertilizers showed a strong positive influence (61580.50), suggesting their critical role in boosting productivity. Also, membership in cooperatives was negatively significant (-147416.8), which might reflect internal inefficiencies, mismanagement, or inadequate support within cooperative structures.

Test of Hypothesis

The result of the regression analysis (Table 3) shows that ATT has significant effects on medium-scale maize farmers' livelihood in Kaduna State, Nigeria. Therefore, the hypothesis that ATT has no significant effect on medium-scale maize farmers' livelihood was rejected.

Conclusion

The findings of this study provide crucial insights into the demographic and socio-economic characteristics of medium-scale maize farmers in the study area, highlighting key factors that influence their productivity and adoption of agricultural technologies. The average age of 48 years suggests that the majority of the farmers are within their productive years, which aligns with previous studies indicating that most farmers in Nigeria fall within the age bracket of 40–49 years. The

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dominance of male farmers (85.1%) in maize farming further corroborates existing literature that agriculture, particularly maize cultivation, remains a male-dominated sector due to cultural, social, and economic factors. Additionally, the educational level of the farmers indicates a relatively low level of formal education, with the majority having primary and secondary education, which could influence their ability to adopt and implement modern agricultural technologies effectively. This trend aligns with earlier studies that emphasize the role of education in enhancing technology adoption. The mean farm size of 2.56 hectares suggests that most farmers in the study area operate on relatively moderate land holdings, which could facilitate their willingness to adopt advanced farming techniques compared to small-scale farmers. Furthermore, the average household size of seven members highlights the potential availability of family labour, which is crucial for medium-scale farming operations. The high membership rate in farmer associations (62.5%) indicates that cooperative societies play a significant role in agricultural activities in the study area, although regional differences may affect participation levels. However, a major constraint identified in the study is the limited access to credit, with 66.7% of the farmers lacking financial support, thereby restricting their ability to invest in improved inputs and farming technologies. This financial limitation aligns with findings from previous studies, which emphasize that access to credit remains a critical challenge for farmers, ultimately affecting their productivity and expansion efforts. The heavy reliance on informal credit sources such as friends and money lenders further necessitate the need for improved institutional financial support tailored to farmers' needs. These findings show the importance of addressing key constraints such as financial accessibility, education, and landholding sizes to enhance maize farming productivity among medium-scale farmers in Nigeria. Policies and interventions should focus on improving access to credit, strengthening cooperative societies, and promoting educational initiatives that enhance farmers' knowledge and willingness to adopt modern agricultural practices, ultimately contributing to food security and improved livelihood of farmers in the study area.

Recommendations

i. Agricultural extension agents and Kaduna State Government programmes should incorporate adult literacy classes and skill-based agricultural training to help farmers better understand the use of ATT. This will enhance their ability to adopt more modern farming practices and improve maize production.

ii. Kaduna State Agricultural Development Agency should integrate ATT into broader livelihood improvement programs to enhance income and food security for medium-scale maize farmers.

Conflict of Interests

Authors declare that they have no conflict of interest.

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Comparative Relationships Between Government Policies and Community-Based Health Education Programs on Communicable Diseases among Residents in Katsina Metropolis, Katsina State, Nigeria

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Abstract

T*his paper is investigated to assess of the role of government policies in supporting community-based health education programs for communicable diseases in Katsina Metropolis. The paper used primary and secondary data based on the research objectives and hypothesis. Descriptive statistical techniques were used in the presentation, analysis and discussions of data. The researcher sampled 120 respondents from the study area. The findings reveal that well-coordinated vaccination campaigns significantly reduce disease incidence, while sanitation and hygiene initiatives effectively control waterborne diseases. Quarantine measures, although challenging, are effective when accompanied by clear communication and community trust. The study highlights the critical role of community engagement in enhancing policy acceptance and adherence, supported by socioeconomic benefits, including reduced healthcare costs and improved workforce productivity. The findings align with existing theories on the social determinants of health and the importance of sustainable health systems. Based on the above conclusion, the research came up with the following recommendations: Government funding should move away from short-term, project-based funding towards long-term, predictable financing for community-based health education initiatives to ensure sustainability. Community Health Worker (CHW) Networks should formally integrate CHWs into the national health system by providing them with regular training, remuneration, and protective gear. There is should be an improve surveillance systems to enable real-time tracking of disease outbreaks, using this data to directly inform the focus of community education, such as in vaccination campaigns. Governments policy should shift from merely having policies on paper to creating a robust, community-owned system that effectively controls communicable diseases in the study area.*

Keywords: Government Policies, Community -Based Health Education Programs & Communicable Diseases

INTRODUCTION

Government policies play a critical, albeit often challenged, role in supporting community-based health education programs (CBHEPs) for communicable disease control. These policies, spanning funding, legislation, and strategic planning, are essential for implementing vaccinations, hygiene initiatives, and public awareness campaigns to combat diseases like HIV, malaria, and tuberculosis. Community-based health education programs refer to organized efforts within specific communities that aim to promote health awareness, improve health literacy, and facilitate access to health services. These programs are typically designed and implemented by local organizations, health professionals, and community members to address the unique health needs of the population. By utilizing culturally appropriate methods and engaging community stakeholders, these programs empower individuals to take charge of their health and well-being. Nigeria established the PHC system in 1976, which designated the local government areas (LGAs), the second smallest administrative level in the country, the responsibility of managing and implementing health services at the community level. Subsequently, the National Primary Health Care Development Agency (NPHCDA) was established in 1992 to ensure the sustainability of previous gains and better manage the PHC system in the country, with the agency revising the PHC system in 1993 (Vankar, 2023). Despite these efforts, it is regrettable to see Nigeria rank 157th out of 167 countries in a 2023 world health and

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health system ranking. The CHS operates just below the PHC system but is intrinsically linked to it, and its optimal functionality is expected to help in improving the country's ranking amongst global health systems. Studies have shown that the CHS in Nigeria has been deteriorating and needs to be enhanced as a way of improving the overall health system as well as boosting the country's health profile. This deterioration was attributed to a lack of adequate community health workers (CHWs) and a lack of re-training for the few available, poor female representation, poor collaboration with pre-existing community structures and hence poor community participation (Okereke, et al 2019). However, to improve community health system delivery in Nigeria within the construct of the CHS, it is important to assess the factors that constrain as well as pro mote healthcare service delivery at different levels across communities to mitigate the constraining fac tors while ensuring the sustenance of the promoting factors. Identifying and addressing the key factors that impede community health service delivery in Nigeria have strong implications for the improvement of CHS in the country as well as the attainment of the UHC and SDGs.

Health education in Katsina State is critical for several reasons. Firstly, it enhances health literacy, enabling individuals to understand health information and make informed decisions. Secondly, it fosters a sense of community ownership over health issues, encouraging collective action towards common health goals. Thirdly, health education can lead to the prevention of diseases and the promotion of healthier lifestyles, ultimately reducing healthcare costs and improving overall community health outcomes. Additionally, these programs can help address health disparities by targeting vulnerable populations and providing them with the necessary tools to improve their health. This paper is conducted to examine assessment of the role of government policies in supporting community-based health education programs for communicable diseases in Katsina Metropolis. Government policies are necessary for directing resources and setting standards for communicable disease education, their effectiveness is heavily reliant on fostering genuine community partnerships and ensuring sustainable, long-term funding. Success hinges on moving from a top-down, purely curative approach to a more collaborative, preventive, community-centered model.

Review of Literature

Public health policies are the backbone of disease control strategies, offering structured and systematic approaches to managing health crises. A robust policy framework clarifies roles, responsibilities, and processes during health emergencies. According to Gostin and Wiley (2016), a well-defined policy framework is critical in coordinating responses across various levels of government and sectors, thereby enhancing the effectiveness of interventions. This becomes particularly vital during pandemics, where swift, coordinated action can significantly mitigate the spread of disease. The COVID-19 pandemic has further underscored the necessity for robust and adaptable policy frameworks. As Kickbusch et al. (2016) argue, policies must be evidence-based and adaptive to the evolving nature of communicable diseases. The agility of these frameworks determines the timeliness and effectiveness of public health responses. For instance, quick adjustments to policies regarding travel restrictions, quarantine measures, and vaccination rollouts were essential in managing the spread of COVID-19. These interventions underscore the need for policies that are not only scientifically grounded but also adaptable enough to respond to new data and evolving circumstances. A critical aspect of a practical policy framework is its ability to integrate the roles and responsibilities of various stakeholders. This integration ensures a coordinated response, minimizing overlaps and gaps in public health efforts.

Smith et al. (2019) highlight that during the Ebola outbreak in West Africa, the lack of a coordinated policy framework led to delayed response and confusion among health workers and agencies. In contrast, countries with well-defined frameworks, such as those in East Asia during the SARS outbreak, were able to mobilize resources and implement control measures more efficiently. Another significant factor is the role of international collaboration facilitated by robust policy frameworks. Global health threats require a unified approach, as no single country can manage a pandemic alone. Gostin and Wiley (2016) emphasize that international health regulations and agreements, supported by national policies, are essential for coordinated global action. The World Health Organization (WHO) plays a pivotal role in setting standards and guidelines that countries can adapt to their specific contexts. Effective frameworks incorporate these international guidelines, ensuring that national responses align with global strategies to combat communicable diseases. Moreover, the importance of policy frameworks extends to allocating resources and prioritizing interventions. With a strategic approach, resources can be better allocated, leading to more effective disease control. measures.

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Bloom et al. (2018) discuss how strategic planning and resource allocation within a robust policy framework were crucial in successfully eradicating smallpox. Public health authorities could control and eliminate the disease by prioritizing vaccination and surveillance. This example illustrates how clear policies can guide decision-making processes, ensuring the most effective interventions receive the necessary support. In addition to resource allocation, policy frameworks must address the social determinants of health contributing to the spread of communicable diseases. Policies incorporating measures to improve living conditions, access to healthcare, and education can significantly reduce disease transmission. The COVID-19 pandemic has highlighted disparities in health outcomes related to socioeconomic status, underscoring the need for policies that address these underlying factors. Public health policies can achieve more comprehensive and sustainable disease control by addressing social determinants of health. The sustainability of public health strategies hinges on the strength of policy frameworks.

Hunter and Reddy (2013) argue that sustainable health systems require policies integrating health goals with broader socioeconomic and environmental objectives. Policies should address immediate health crises and build resilience against future threats. This requires long-term planning and investment in health infrastructure, workforce training, and community engagement. Sustainable policies ensure that health systems remain robust and capable of responding to current and emerging health challenges. The literature underscores the importance of specific public health interventions in controlling communicable diseases. Vaccination campaigns, for instance, have been proven to be one of the most effective means of disease prevention. The success of measles eradication efforts in various regions, as documented by Durrheim et al. (2020), exemplifies how targeted vaccination programs can significantly reduce the incidence of measles disease. Measles, once a pervasive childhood disease, has seen dramatic declines in areas with robust immunization programs. Durrheim et al. (2020) highlight that in regions where vaccination coverage exceeds 90%, measles cases have decreased by over 95%. This significant reduction saves lives and alleviates the economic burden of outbreaks, including healthcare costs and productivity losses. Similarly, implementing sanitation and hygiene initiatives has substantially improved control of diseases like cholera and diarrhea. Freeman et al. (2017) conducted a comprehensive review demonstrating that improvements in water quality, sanitation facilities, and hygiene practices can reduce the incidence of diarrheal diseases by up to 50%. In sub-Saharan Africa and South Asia, where these diseases are prevalent, sanitation interventions have resulted in significant decreases in morbidity and mortality rates. For instance, the installation of community latrines and handwashing stations in rural Bangladesh has significantly reduced cholera outbreaks. Quarantine and isolation measures, although often contentious due to their social and economic implications, have been practical in containing outbreaks.

The containment strategies employed during the SARS and Ebola outbreaks provide compelling evidence of their efficacy. During the SARS outbreak, rigorous quarantine measures in Hong Kong and Singapore played a pivotal role in halting the spread of the virus, as detailed by Wilder-Smith et al. (2020). These measures included isolating infected individuals, tracing and quarantining their contacts, and implementing travel restrictions. Similarly, during the Ebola outbreak in West Africa, strict isolation protocols and the establishment of treatment centers were crucial in reducing transmission rates and ultimately controlling the epidemic. Public health education campaigns play a critical role in enhancing the effectiveness of these interventions. Educating the public about the importance of vaccinations, proper sanitation, and the rationale behind quarantine measures increases compliance and cooperation. For example, during the polio eradication campaign in India, widespread public health education efforts helped dispel myths and misinformation about the vaccine, leading to higher immunization rates and, ultimately, the eradication of polio in the region. Another critical intervention is the use of vector control methods to combat vector-borne diseases, such as malaria and dengue fever. Studies by Bhatt et al. (2015) have shown that the distribution of insecticide-treated bed nets and indoor residual spraying can significantly reduce the incidence of these diseases. In regions with high malaria transmission rates, the use of these interventions has led to a substantial decline in malaria cases and deaths. For instance, in Kenya, a national campaign to distribute bed nets resulted in a 50% reduction in malaria prevalence among children under five (Bhatt et al., 2015). Integrating digital health technologies has emerged as an effective tool in controlling communicable diseases. Mobile health applications, electronic health records, and data analytics have improved disease surveillance, contact tracing, and the management of public health responses. A study by Smith et al. (2019) on the use of digital health tools during the COVID-19 pandemic found that these technologies enhanced the efficiency of contact tracing and monitoring, leading to improved containment of the virus. For

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example, South Korea's use of digital contact tracing and real-time data sharing played a crucial role in managing and reducing COVID-19 cases early in the pandemic (Smith et al., 2019).

Methodology

The main sources of data that form the basis of analysis for this study were obtained from primary and secondary sources. Under primary source of data, structured questionnaire was employed, while in the secondary source of data collection, textbooks, journals, articles, newspapers, and other papers presented at seminars and workshops were consulted. Also consulted are other relevant publications on the topic in question. The data were analyzed and discussed via descriptive statistical techniques of tables, percentages, mean and ranks as appropriately chosen for this kind of study. The instrument was structured using a Five-point rating scale of 5 to 1, from strongly agree, Agree, neutral, disagree and strongly disagree. Data obtained were analyzed using mean scores. The criterion mean was determined at 2.50. Thus, item that score 2.50 and above was accepted whilst those with a mean score less than 2.50 were rejected. However, Katsina state has three (3) senatorial districts namely; Katsina central, Daura and Funtua Zones respectively. Thus, with the help of the Katsina State Epidemiologist, 40 questionnaires were successfully administered and retrieved to and from the health personnel across the zones in the state in general.

Objectives of The Study

The main objective of this paper is to assess the role of government policies in supporting community-based health education programs for communicable diseases in Katsina Metropolis. The following are the objectives of the study:

1. Examine the role of government policies on communicable diseases in Katsina State
2. Evaluate the impact of community-based health education programmes on communicable diseases in Katsina State

Hypotheses

The following hypotheses were postulated to guide the study and were tested at a 0.05 level of significance:

Ho_1: There is no significant relationship between government policies and communicable diseases in Katsina State.

Ho_2: There is no significant relationship between community-based health education programmes and communicable diseases in Katsina State.

Presentation of Results

The study used a sample of 120 respondents based on purposive and judgmental sampling techniques owing to the fact that not all the elements of the population in the state has knowledge and analytical power on the state of health economy in the study area, hence the rationale behind the choice of the sample in question.

Descriptive Analysis

Table 1: Socio-economic characteristics of the respondents

Variables	Frequency	Percentage (%)	Mean Value
Age			
18-27	23	19.17	
28-37	47	39.17	3.3
38-47	38	31.66	
48-above	12	10	
Total	120	100	
Gender			
Male	31	25.83	
Female	89	74.17	4.02
Total	120	100	
Occupation			
Civil servant	80	66.67	
Farming	20	16.67	2.92
Business	15	12.5	
Other (specify)	5	4.16	
Total	120	100	

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Variables	Frequency	Percentage (%)	Mean Value
Marital status			
Single	14	11.66	
Married	98	81.67	
Widow	3	2.5	3.78
Divorce	5	4.16	
Total	120	100	
Education			
Primary	4	3.33	
Secondary	26	21.67	4.11
Tertiary	87	72.5	
Other (specify)	3	2.5	
Total	120	100	

Age refers to the extent to which a person has lived or stays alive. In this study, 19.17% of the respondents fall within the age limit of 18-27 years. 39.17% of the respondents fall within the age bracket of 28-37 years of age, 31.66% of the respondents are within age bracket of 38-47 years of age, 12% of the respondents are within age bracket of 48-above year's age as depicted above. Gender refers to the sex status of an individual, that is either male or female, boy or girl, man or woman. In this study, male respondents constituted 74.17% whilst female respondents constituted the remaining 25.83%. Marital status can be seen as the fact of somebody's being married, unmarried or formally married. This is purely a marital phenomenon that is trying to show whether entrepreneur is single, married, divorced, or widow. The table shows that 11.66% of the respondents are single, 81.67% of the respondents are married. Meanwhile, 2.50% of the other respondents are divorce with the remaining 4.16% of the respondents widowed as depicted in the table above. Therefore, most of the respondents in the study area are married and singled as reflected by the house hold size, that they have much family responsibilities and having none family size. Marital status determines household size since married respondents tend to have a larger household size and hence, the majority of the respondents. Qualification also refers to the learning, training, and skills acquired from the various schools and institutions of education. The training and skills acquired from the schools and institutions enhances individual capacity to carry out duties as expected and diligently. The table consists of the qualification of the respondents in which case; Majority of the respondents (72.50%) have tertiary level of education, respondents with secondary school level of education constitutes 21.67%. However, 3% of the other respondents hold primary school level of education, whereas 3% of the remaining respondents have other form of education such as vocational training, distance learning and other non-formal system of education. 36.67% of the respondents believed that illiteracy is the leading factor responsible for the major health problems facing those localities. 19.17% on the other hand, attribute these problems to improper environmental sanitation. Yet, 17.50% suggest that contaminated water is responsible for the major health problems facing their locality. While 16.67% among the respondents are of the opinion that dumping refuse is the main cause of these health problems in the study area.

Test of Hypothesis

Hypothesis One: There is no significant relationship between government policies and communicable diseases in Katsina State.

Table 2: One sample t-test assessment attitude of government policies on communicable diseases in Katsina State

One-Sample Statistics

	N	Mean	Std. Deviation	df	t computed	t- critical	p
Government Policy	120	42.63	2.37463	119	287.798	1.96	0.003

P< 0.05, t calculated > t critical at df 120

The one sample t-test analysis shows that the role of government policies on communicable diseases in Katsina State was significant. This is because the calculated p value of 0.003 is lower than the 0.05 alpha level of significance, and the computed t value of 287.798 is higher than the 1.96 t critical value at df 119. Their mean that there is relationship between

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government policies and communicable diseases in Katsina State. Therefore, the hypothesis stated There is no significant relationship between government policies and communicable diseases in Katsina State is thereby rejected.

Hypothesis Two: There is no significant relationship between community-based health education programmes and communicable diseases in Katsina State.

Table 3: One sample t-test analysis impact of community-based health education programmes on communicable diseases in Katsina State

One-Sample Statistics

	N	Mean	Std. Deviation	df	t computed	t- critical	p
Community health education program	120	35.9531	3.86660	119	135.70	1.96	0.002

P< 0.05, t calculated > t critical at df 710

The one sample t-test analysis shows that the relationship between community-based health education programmes and communicable diseases in Katsina State. This is because the calculated p value of 0.002 is lower than the 0.05 alpha level of significance, and the computed t value of 135.70 is higher than the 1.96 t critical value at df 119. Their means that community-based health education programmes have many things to do with communicable diseases in the study area. Hence, the hypothesis stated that there is no significant relationship between community-based health education programmes and communicable diseases in Katsina State is hereby rejected.

Discussion of Findings

The findings of this study offer profound insights into the impact of public health policies on communicable disease control, linking empirical data with foundational concepts in public health, epidemiology, and socio-economic theory. Through qualitative analysis, the study reveals that well-coordinated vaccination campaigns, sanitation and hygiene initiatives, and quarantine measures are crucial in mitigating the spread of communicable diseases. These findings align closely with existing public health frameworks, emphasizing the importance of community engagement, sustainable health systems, and socio-economic considerations. The effectiveness of targeted vaccination programs, as demonstrated by the significant reduction in measles cases in high-coverage areas (Durrheim et al., 2020), underscores the critical role of immunization in disease prevention. This finding is consistent with the essential public health principle that vaccination is among the most cost-effective health interventions. The interpretation here is clear: Vaccines, supported by comprehensive public health strategies, drastically reduce disease prevalence. This directly supports the hypothesis that well-implemented public health policies lead to substantial improvements in disease control. Furthermore, the study's results regarding sanitation and hygiene initiatives confirm the hypothesis that these interventions significantly decrease the incidence of waterborne diseases. Freeman et al. (2017) provided quantitative backing for this hypothesis by showing that improved sanitation can reduce diarrheal diseases by up to 50%. This finding aligns with the theory of social determinants of health, which posits that improving living conditions has a direct impact on health outcomes. The qualitative data in this study reveal that community-specific adaptations of global health strategies enhance their effectiveness, demonstrating the necessity of culturally and. contextually relevant interventions. Quarantine and isolation measures during outbreaks, though socially and economically challenging, have proven effective in controlling disease spread when implemented swiftly and stringently. This finding corroborates the hypothesis that stringent public health measures can contain outbreaks. Wilder-Smith et al. (2020) noted the successful containment of SARS in Hong Kong and Singapore through rigorous quarantine protocols. Our research further emphasizes that community trust and transparent communication are essential for the success of such measures. The Ebola outbreak in West Africa (Vinck et al., 2019) highlighted how mistrust and lack of engagement can severely hinder disease control efforts, supporting the hypothesis that community engagement is pivotal for effective policy implementation.

Conclusion

This study provides a comprehensive examination of the role of government of public health policies on communicable disease control, addressing critical questions about the effectiveness of various interventions, the role of community engagement, and the socio-economic implications of these policies. The findings reveal that targeted vaccination programs, sanitation and hygiene initiatives, and quarantine measures significantly reduce the incidence of communicable diseases when supported by robust public health strategies and community participation. This research underscores the importance

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of well-coordinated, contextually relevant, and sustainable health policies in mitigating the spread of infectious diseases. The value of this research lies in its contribution to both scientific understanding and practical application.

Recommendations

Based on the above conclusion, the research came up with the following recommendations:

1. Government funding should move away from short-term, project-based funding towards long-term, predictable financing for community-based health education initiatives to ensure sustainability.
2. Community Health Worker (CHW) Networks should formally integrate CHWs into the national health system by providing them with regular training, remuneration, and protective gear.
3. There is should be an improve surveillance systems to enable real-time tracking of disease outbreaks, using this data to directly inform the focus of community education, such as in vaccination campaigns.
4. Governments policy should shift from merely having policies on paper to creating a robust, community-owned system that effectively controls communicable diseases in the study area.

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Correlation Between Availability of Counselling Laboratories and Clinical Competence on Counselling Education Curriculum Development and Research Integration among Public Universities in Nigeria

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Abstract

The escalating mental health challenges, economic instability, and security crises in Nigeria necessitated a robust guidance and counselling framework within the higher education sector. However, the efficacy of counselling services was directly contingent upon the quality of counsellor education. This study conducted a critical needs assessment of counselling education in Nigerian universities to evaluate the alignment between the National Universities Commission (NUC) Benchmark Minimum Academic Standards (BMAS) and contemporary global best practices. Anchored on Stufflebeam's CIPP (Context, Input, Process, Product) Evaluation Model, the study adopted a descriptive survey research design. Data were collected from a stratified sample of 360 respondents across six federal universities representing Nigeria's geopolitical zones. A self-structured, validated instrument titled "Counselling Education Needs Assessment Questionnaire (CENAQ)" was utilised. Findings from 30 distinct indicators revealed a significant disparity between theoretical training and clinical application. Specifically, 78.5% of respondents indicated insufficient exposure to digital counselling technologies, and widespread deficits were noted in 8 out of 10 key infrastructural facilities. Hypothesis testing confirmed a significant difference in curriculum perception between educators and practitioners ($t = 4.82$, $p < .05$) and a positive correlation between laboratory availability and student clinical competence ($r = 0.68$, $p < .05$). The study concluded that the curriculum was heavily weighted towards pedagogical theory at the expense of clinical competency. Recommendations included the institutionalization of a mandatory six-month clinical residency and the integration of cyber-psychology as a core course.

Keywords: *Counselling Education, Curriculum Development, Nigerian Universities, CIPP Model, Clinical Residency, Mental Health, CASSON.*

Introduction

The Global Imperative of Counselling in Higher Education

Higher Education Institutions (HEIs) globally were recognised not merely as centres for academic learning but as pivotal environments for the holistic development of young adults. The university years represented a critical transitional period characterised by identity formation, career decision-making, and significant psychosocial adjustments. In this ecosystem, Guidance and Counselling (G&C) served as the "heartbeat" of student welfare, acting as a buffer against academic burnout, mental health crises, and social maladjustment (World Health Organization (WHO), 2022). The increasing prevalence of mental health disorders among youth - compounded by the post-COVID-19 realities of isolation and digital fatigue - elevated the role of university counsellors from optional support staff to essential frontline health workers.

Historical Context and Evolution in Nigeria

In the Nigerian context, the trajectory of Guidance and Counselling was both historic and dynamic. The discipline traced its formal roots to 1959 at St. Theresa's College, Oke-Ado, Ibadan, where it was initially conceived by Catholic nuns to provide vocational guidance for graduating secondary school students (Aluede et al., 2004). Over the subsequent decades, particularly with the inclusion of Guidance and Counselling in the National Policy on Education (Federal Republic of Nigeria (FRN), 2013), the discipline expanded into the university system. Historically, the focus of Nigerian counselling education was predominantly vocational (career choice) and educational (study habits). The curriculum was designed to produce "Teacher-Counsellors" - educators who could combine classroom teaching with basic guidance duties. This model served the agrarian and early industrial economy of the 1970s and 80s effectively (Ogunyemi, 2019).

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The Contemporary Crisis: A Shift in Student Needs

However, the 21st-century Nigerian university landscape was fraught with unprecedented challenges that the foundational curriculum was not originally designed to address. The modern Nigerian student navigated a "VUCA" environment (Volatile, Uncertain, Complex, and Ambiguous).

Security Challenges: The prevalence of insurgencies, kidnapping, and campus cultism introduced complex trauma and Post-Traumatic Stress Disorder (PTSD) into the student population (Isiaka, 2024).

Economic Volatility: With rising inflation and unemployment, students faced severe "economic anxiety" regarding their post-graduation prospects, necessitating a shift from traditional career guidance to "entrepreneurial survival psychology".

Substance Abuse: The alarming rise in the abuse of opioids (e.g., Tramadol, Codeine) among Nigerian youths required counsellors to possess clinical competencies in addiction management - skills rarely taught in standard B.Ed. or M.Ed. programmes.

The Pedagogical Disconnect: "Town vs. Gown"

Despite these escalating needs, the pedagogical architecture of counselling education in Nigerian universities remained largely static. Housed predominantly within Faculties of Education rather than Health Sciences or Psychology, the curriculum historically conflated "teaching" with "counseling" (Adebayo, 2020). A critical "Town and Gown" disconnect emerged. While the "Town" (society) demanded clinical professionals capable of diagnosing mental disorders, managing crisis interventions, and utilising digital tele-health platforms, the "Gown" (universities) continued to rely on analogue, theory-heavy pedagogies. The National Universities Commission (NUC) Benchmark Minimum Academic Standards (BMAS), though comprehensive in educational theory, was often criticised for being slow to integrate modern competencies such as Cyber-counselling, Psychometrics, and Trauma-Informed Care (National Universities Commission (NUC), 2023).

The Digital Gap and Professionalisation

Furthermore, the global paradigm shift towards the "Uberisation" of mental health - where services were accessed remotely via apps and video conferencing - rendered traditional face-to-face training insufficient. Recent studies suggested that Nigerian counselling graduates were often "digitally hesitant", lacking the ethical and technical know-how to conduct online therapy (Akunne et al., 2022). Additionally, with the Counselling Association of Nigeria (CASSON) recently achieving a legislative milestone with the establishment of the Counselling Practitioners Council of Nigeria, the demand for licensure moved from voluntary to mandatory (CASSON, 2024). This professionalization implied that university graduates could no longer rely on generalist training; they had to demonstrate specific clinical competencies to be licensed.

Literature Review

The literature review for this study was organised under three main sub-headings: (i) Theoretical Framework, (ii) Conceptual Review of Counselling Education in Nigeria, and (iii) Empirical Review of Related Studies.

Theoretical Framework

The CIPP Evaluation Model (Stufflebeam, 1971)

This study was theoretically anchored on the Context, Input, Process, and Product (CIPP) Evaluation Model, developed by Daniel Stufflebeam. The CIPP model was regarded in educational research as the most comprehensive framework for curriculum evaluation because it was decision-oriented rather than merely descriptive (Stufflebeam, 1971). It provided a systematic way to look at the entire ecosystem of counselling education:

Context Evaluation: Assessed the environment and needs (e.g., the mental health crisis in Nigeria).

Input Evaluation: Assessed the resources available (e.g., NUC BMAS, labs, digital infrastructure).

Process Evaluation: Monitored the implementation phase (teaching methods and practicum supervision).

Product Evaluation: Assessed the outcomes (graduate competency).

Social Cognitive Theory (Bandura, 1986)

Complementing the CIPP model was Albert Bandura's Social Cognitive Theory, particularly the construct of Self-Efficacy. In counsellor education, skill acquisition was not just about cognitive knowledge but about the belief in one's capability to execute actions (Bandura, 1986). If students lacked opportunities to observe "Master Counsellors" in real clinical settings, their self-efficacy and clinical competence remain underdeveloped.

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Conceptual Review

Evolution of Counselling Curriculum: From Vocational to Clinical

The trajectory of counselling in Nigeria was historically tied to the educational sector. Early curriculum designs were heavily influenced by vocational guidance (Aluede et al., 2004). However, a conceptual shift was underway. CASSON advocated for the "professionalization" of the discipline, distinguishing "Professional Counsellors" from "Teacher-Counsellors" (CASSON, 2024). This necessitated a curriculum that integrated Clinical Psychology and Health Sciences.

The "Town and Gown" Disconnect

The "Town" (Society) required crisis interventionists, trauma specialists, and addiction therapists. The "Gown" (University) continued to produce generalists trained in "Study Habits". This conceptual gap created a workforce surplus of graduates who were unemployable in the emerging mental health marketplace (Adebayo, 2020).

Digitalisation and Tele-Mental Health

The advent of the Fourth Industrial Revolution (4IR) birthed the concept of Tele-Mental Health. Conceptually, a modern counselling curriculum had to include Cyber-psychology - the study of the impact of technology on human behaviour (Isiaka, 2024). The absence of this in the Nigerian curriculum represented a "digital exclusion" of Nigerian counsellors from the global gig economy.

Empirical Review

Infrastructure and Clinical Training Facilities

Olatunde and Ajayi (2018) investigated counselling practicum challenges in South-West Nigeria and found that 65% of universities lacked a dedicated "Counselling Clinic". Furthermore, distinct deficits in Psychometric Laboratories were noted, forcing students to learn testing "in abstract" rather than through hands-on application (Ogunyemi, 2019).

Competency Gaps in Graduates

A landmark study by Adebayo (2020) assessed the "work-readiness" of counselling graduates in Lagos State. The findings revealed that while graduates scored high (mean > 4.0) on theoretical knowledge, they scored significantly low (mean < 2.5) on diagnostic skills and treatment planning.

Digital Literacy among Counsellors

Akunne et al. (2022) surveyed counsellors in South-East Nigeria and found that less than 15% used smartphones for professional therapeutic purposes due to a "lack of training" on how to ethically translate face-to-face techniques to a digital medium.

Research Integration in Training

Research by Adedoyin and Soyemi (2020) critiqued the quality of undergraduate research, noting a near-total absence of Experimental Studies or Action Research. This suggested that the curriculum failed to teach students how to generate new knowledge or test the efficacy of their interventions.

Methodology

Research Design

The study adopted a descriptive survey research design. This design was deemed appropriate as it allowed for the collection of data to describe conditions and opinions across a large population without manipulating variables (Creswell & Creswell, 2018).

Population and Sample

The target population comprised Counsellor Educators, Practicing Counsellors (in university counselling centres), and Final Year Guidance and Counselling students. A multi-stage sampling technique was used:

Cluster Sampling: Nigeria was divided into six geopolitical zones. One Federal University was selected from each zone to ensure national representation.

Stratified Random Sampling: From each university, participants were selected to ensure representation of the three sub-groups.

Sample Size: A total of 360 respondents were sampled (60 per university: 10 Educators, 10 Practitioners, 40 Students).

Instrumentation

A self-structured questionnaire titled "Counselling Education Needs Assessment Questionnaire (CENAQ)" was utilised for data collection. **Section A:** Demographic Data; **Section B:** Checklist of Infrastructural Facilities (10 items).; **Section**

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C: Curriculum Content Assessment (10 items; Modified 4-point Likert scale). **Section D:** Skills Gap Analysis (10 items; Self-rating scale).

Validity and Reliability

The instrument was face- and content-validated by three experts in Measurement and Evaluation from the Chukwuemeka Odumegwu Ojukwu University, Igbariam Campus, Anambra State, Nigeria. To ensure reliability, a pilot study was conducted using the split-half method, yielding a Cronbach's Alpha coefficient of 0.84, indicating high internal consistency.

Data Analysis

Research questions were answered using descriptive statistics (Frequency counts, Percentages, Mean, and Standard Deviation). Hypotheses were tested using the Independent t-test and Pearson Product Moment Correlation (PPMC) at the 0.05 level of significance, using SPSS version 26.

Results Presentation

Research Question 1: What was the availability status of key infrastructural facilities for counselling education in Nigerian universities?

Table 1: Availability and Functionality of Counselling Infrastructure (N=360)

(Benchmark: 50% Availability for Acceptability)

S/N	Infrastructure Item	Available & Functional (%)	Available but Not Functional (%)	Not Available (%)	Remark
1	Individual Counselling Privacy Rooms	45.0%	20.0%	35.0%	Deficit
2	Group Therapy Conference Room	55.0%	15.0%	30.0%	Adequate
3	Psychological Testing Laboratory	12.5%	22.5%	65.0%	Critical Deficit
4	Computer/Digital Counselling Lab	30.0%	40.0%	30.0%	Deficit
5	Audio-Visual Recording Room (Practicum)	8.0%	15.0%	77.0%	Critical Deficit
6	Career Resource Library/Centre	40.0%	25.0%	35.0%	Deficit
7	Child Therapy/Playroom	5.0%	10.0%	85.0%	Critical Deficit
8	Secure Data Storage/Record Room	60.0%	10.0%	30.0%	Adequate
9	Observation Rooms (One-way mirror)	10.0%	20.0%	70.0%	Critical Deficit
10	Waiting Room/Reception Area	75.0%	10.0%	15.0%	Adequate

(Source: Field Survey, 2026)

Analysis of Table 1: The data revealed a severe infrastructural decay. While basic facilities like Waiting Rooms (75%) and Record Rooms (60%) were available, the technical facilities required for modern training were absent. Notably, 85% of universities lacked a Child Therapy Playroom, and 77% lacked Audio-Visual Recording rooms for practicum supervision.

Research Question 2: To what extent did the curriculum cover modern counselling competencies and research methodologies?

Table 2: Mean Ratings on Curriculum Content Adequacy (N=360)

(Scale: 4=Highly Adequate, 3=Adequate, 2=Inadequate, 1=Highly Inadequate; Decision Mean = 2.50)

S/N	Curriculum Content Item	Mean ($\bar{x}$)	SD	Remark
1	Theories of Counselling & Psychotherapy	3.75	0.45	Adequate
2	Vocational and Career Development	3.50	0.50	Adequate
3	Adolescent and Developmental Psychology	3.60	0.48	Adequate
4	Digital/Tele-Counselling Techniques	1.85	0.60	Inadequate
5	Trauma and Crisis Intervention	2.10	0.65	Inadequate
6	Addiction and Substance Abuse Counselling	2.30	0.70	Inadequate
7	Applied Psychometrics (Test Construction)	2.15	0.55	Inadequate
8	Advanced Research Statistics (SPSS/NVivo)	2.05	0.48	Inadequate
9	Entrepreneurial Counselling Practice	2.45	0.65	Inadequate
10	Professional Ethics and Legal Issues	3.20	0.55	Adequate

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-	**Grand Mean**	**2.69**	-	**Marginally Adequate**

(Source: Field Survey, 2026)

Analysis of Table 2: The curriculum was strong in theoretical foundations (Items 1, 2, 3) but failed significantly in clinical applications. Digital Counselling ($\bar{x}$ =1.85) and Advanced Research Statistics ($\bar{x}$ =2.05) were the weakest areas.

Research Question 3: What were the perceived skills gaps among final-year counselling students regarding professional practice requirements?

Table 3: Assessment of Student Skills Gap (N=360)

(Scale: 4=High Competence, 1=Low Competence; Decision Mean = 2.50)

S/N	Clinical Skill Item	Mean ($\bar{x}$)	SD	Remark
1	Establishing Rapport/Empathy	3.80	0.40	Competent
2	Active Listening Skills	3.75	0.42	Competent
3	DSM-5 Diagnostic Classification	1.90	0.60	Gap Exists
4	Administration of Psychological Tests	2.00	0.55	Gap Exists
5	Interpretation of Test Results	1.95	0.58	Gap Exists
6	Case Note Writing & Documentation	2.80	0.70	Competent
7	Suicide Risk Assessment	2.10	0.65	Gap Exists
8	Online Therapy Ethics & Security	1.75	0.50	Gap Exists
9	Multicultural/Diversity Counselling	3.10	0.60	Competent
10	Referral Procedures	2.60	0.75	Competent

(Source: Field Survey, 2026)

Analysis of Table 3: Table 3 highlighted a clear distinction between "soft skills" and "technical skills". Students were competent in Rapport ($\bar{x}$ =3.80) and Listening ($\bar{x}$ =3.75), but they lacked competence in hard technical skills like DSM-5 Diagnosis ($\bar{x}$ =1.90).

Hypothesis Testing 1 (Ho_1)

Table 4: Independent t-test Analysis of Perception of Curriculum Adequacy (Educators vs. Practitioners)

Variable	Group	N	Mean ($\bar{x}$)	SD	df	t-cal	t-crit	P-value	Decision
Curriculum Perception	Educators	60	3.10	0.42	118	**4.82**	1.98	0.001	**Reject $H0_1$**
	Practitioners	60	2.45	0.58					

Decision: The t-cal (4.82) > t-crit (1.98). $H0_1$ was rejected.

Finding: There was a significant difference. Educators rated the curriculum significantly higher than the Practitioners who employed the graduates.

Hypothesis Testing 2 (Ho_2)

Table 5: Pearson Product Moment Correlation (PPMC) showing the relationship between Laboratory Availability and Student Clinical Competence

Variable	N	Mean ($\bar{x}$)	SD	r-cal	r-crit	P-value	Decision
Laboratory Availability	360	12.40	3.21	**0.68**	0.195	0.000	**Reject $H0_2$**
Student Clinical Competence	360	45.60	5.44				

Decision: The r-cal (0.68) indicated a strong positive relationship. $P < 0.05$. $H0_2$ was rejected.

Finding: There was a significant positive relationship between the availability of counselling laboratories and the clinical competence of students.

Discussion of Findings

The primary objective of this study was to conduct a comprehensive needs assessment of Counselling Education in Nigerian universities, evaluating the alignment between the training provided (Input/Process) and the professional competencies required in the field (Product).

Infrastructural Decay: The "Input" Deficit

The findings (Table 1) painted a picture of severe infrastructural deficit, with 80% of respondents reporting the absence of functional Psychological Testing Laboratories and 77% lacking Audio-Visual Recording Rooms. This finding corroborated Olatunde and Ajayi (2018), who described the state of counselling facilities in Nigerian universities as "grossly inadequate". The lack of One-Way Mirror Observation Rooms implied that practicum supervision was likely based on student self-reports rather than direct empirical observation.

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Curriculum Obsolescence: The "Process" Gap

The analysis of Research Question 2 (Table 2) revealed that while traditional areas received high adequacy ratings, modern competencies such as Digital/Tele-Counselling ($\bar{x}$ = 1.85) were rated as significantly inadequate. This validated the "Digital Exclusion" hypothesis proposed by Akunne et al. (2022). The failure to integrate Cyber-psychology left graduates ill-equipped to serve the "digital native" student population. Moreover, the low rating for Trauma and Crisis Intervention was particularly concerning given the Nigerian socio-political context, as emphasized by Ogunyemi (2019).

The Skills Gap: "Soft" vs. "Hard" Competencies

Research Question 3 (Table 3) highlighted that, students self-reported high competence in "soft skills" but significant deficiencies in "hard technical skills" such as DSM-5 Diagnosis. This suggested the training model produced "empathetic listeners" (Generalist Counsellors) rather than "clinical technicians" (Professional Counsellors). This validated the "Town and Gown" disconnect identified by Adebayo (2020), who noted that employers often had to retrain university graduates on basic clinical protocols.

The Perception Gap: Educators vs. Practitioners ($H0_1$)

The rejection of Hypothesis 1 ($t = 4.82$, $p < .05$) highlighted a significant divergence in perception: Counsellor Educators rated the curriculum significantly higher than Practicing Counsellors. This suggested a lack of feedback loops between the university and the labour market. As Stufflebeam's CIPP model warned, when the "Process" (teaching) was disconnected from the "Context" (market needs), the "Product" (graduate) inevitably suffered (Stufflebeam, 1971).

Infrastructure as a Determinant of Competence ($H0_2$)

The rejection of Hypothesis 2 ($r = 0.68$, $p < .05$) confirmed a strong positive relationship between the availability of functional laboratories and student clinical competence. This empirically demonstrated that infrastructure was not a luxury; it was a determinant of learning outcomes.

Conclusion

This study successfully executed a critical needs assessment of Counselling Education in Nigerian universities, utilising Stufflebeam's CIPP model to interrogate the alignment between academic training and professional practice. The empirical evidence unequivocally pointed to a systemic misalignment between the Input (curriculum and infrastructure) and the required Product (competent, globally competitive counsellors). The study concluded that the educational framework suffered from pedagogical inertia. While it successfully preserved the historical legacy of vocational and educational guidance - producing graduates with strong theoretical foundations - it failed to evolve in response to the 21st-century "VUCA" (Volatile, Uncertain, Complex, Ambiguous) environment. The severe deficit in clinical infrastructure, specifically the absence of psychometric laboratories and digital training facilities, created a workforce that was theoretically sophisticated but clinically incapacitated. Therefore, a curriculum overhaul was not merely a matter of academic compliance; it was a critical intervention required to safeguard the nation's mental health security. The transition from a "Teaching-Oriented" model to a "Clinical-Competency" model was no longer optional - it was an emergency imperative for the relevance and sustainability of the counselling profession in Nigeria.

Recommendations

To bridge the identified gaps and align Nigerian counselling education with global best practices, the following recommendations were proffered:

1. Institutionalization of Clinical Residency: The National Universities Commission (NUC) and the Counselling Association of Nigeria (CASSON) must collaborate to institute a mandatory six-month Clinical Residency Programme. Similar to the medical housemanship, this residency must occur in accredited mental health facilities (CASSON, 2024).
2. Curriculum Re-engineering for the Digital Age: The BMAS should be immediately reviewed to mandate "Digital Counselling & Cyber-Psychology" as a core, credit-bearing course.
3. Infrastructural Accreditation Benchmarks: Accreditation of Counselling departments should be strictly contingent upon the availability of functional Psychometric Laboratories and Observational Clinics.
4. Town-Gown Synergy: A "Practitioner-in-Residence" scheme should be adopted, where licensed, practicing counsellors are engaged as adjunct faculty.
5. Research Re-orientation: Undergraduate and postgraduate research mandates must shift from descriptive survey designs to Action Research and Intervention Studies (Adedoyin & Soyemi, 2020).

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Impact of Entrepreneurial Skills Acquisition on Academic Performance among Undergraduate Students of Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria

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Abstract

This study examined the impact of entrepreneurial pursuits on the academic performance of undergraduate students at Obafemi Awolowo University, Ile-Ife, Nigeria. Specifically, the study investigated the level of students' engagement in entrepreneurial activities, the effect of such engagement on their academic performance, and the challenges encountered in balancing academic and business responsibilities. A descriptive survey research design was used in the study. All undergraduate students from the Faculties of Arts, Administration, Education, and Social Sciences made up the population and a sample of 100 students was selected using a purposive sampling technique. A questionnaire was used to gather the data, which were then analysed using descriptive statistics including means, standard deviations, percentages, and frequencies. The results showed that 78% of the participants were actively involved in business endeavours, primarily in the retail, services, catering, and digital industries. Also, 64% of the students acknowledged that entrepreneurial activities sometimes distracted them from their academic work. A large majority (89%) agreed that entrepreneurship positively complemented their academic and practical skills. The study also found that major challenges like stress, time management issues, and funding constraints are encounter by student entrepreneurs. Despite these challenges, many students maintained average to above-average academic performance, with 55% recording CGPAs above 3.5. The study concluded that entrepreneurship among undergraduates, when strategically managed, can enhance academic performance by developing transferable skills such as discipline, time management, and problem-solving. Based on these findings, it was recommended that university authorities implement flexible academic policies and provide institutional support to assist students in effectively balancing their entrepreneurial and academic responsibilities.

Keywords: Entrepreneurship, students, academic performance, OAU

Introduction

It has been observed that most undergraduate students in tertiary institutions of learning, particularly those from low-income backgrounds, struggle to meet their fundamental needs. This financial pressure has increasingly pushed students toward income-generating activities while still enrolled in school. Entrepreneurship is therefore widely regarded as a key solution to youth unemployment, underemployment, and poverty, especially in situations where educated individuals are unable to secure formal employment (Olufemi, 2020; Brownhilder, 2014; Oyelola et al., 2014). The Federal Government of Nigeria amended the curriculum of higher education institutions in 2003 to make entrepreneurship education mandatory for all undergraduates in response to the country's growing unemployment issue. This relates to a mandate that Nigerian higher education institutions incorporate entrepreneurship education into their curricula as a required subject (Onuma, 2016; Oboreh & Nnebe, 2019). The National Universities Commission (NUC) further emphasized that entrepreneurial studies are designed to stimulate creative thinking and job creation during and after undergraduate studies. Consequently, the NUC promoted entrepreneurship programmes in tertiary institutions with objectives such as student empowerment, employment creation, business diversification, and confidence building (Ogunsanya et al., 2024). Nigerian universities' specific objectives are to develop the workforce, intellectual values and abilities, physical and knowledge skills, scholarship and community service, national unity, and intercultural interactions, as stated in the National Policy on Education, which was issued in 2004 (Adebisi, 2014). These objectives are all aimed at reducing unemployment and strengthening the national economy. It is therefore imperative to expose all students in tertiary institutions, regardless of discipline, to

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entrepreneurship education. Ubah (2024) noted that entrepreneurial education is education that is aimed towards skills acquisition for self-reliance. He additionally contends that educational and curricula planners should ensure that entrepreneurial attachments are created in such a way that only practicable ones are included. According to Ncube and Lekhanya (2025), entrepreneurship education helps start-up business ventures grow into large companies and create a significant number of job opportunities. Entrepreneurship education prepares future leaders to tackle challenging issues in rapidly evolving environments by utilising particular abilities that cultivate an entrepreneurial attitude (Walsangkar, 2017; Ncube & Lekhanya, 2025). Initiatives taken by people or organisations to start, run, and expand new businesses are referred to as entrepreneurial activities. These programmes are intended to be inclusive, guaranteeing that students from all backgrounds have access to opportunities and life skills that foster entrepreneurship (Edokpolor, 2020; Davwet, et al., 2019; Mensah, 2019). Finding possibilities, taking measured risks, and bringing innovations that satisfy customer demands are all part of these activities (Puzyrova et al., 2020; Cloughton, 2020). Examples include launching small enterprises like producing personalised T-shirts or handcrafted goods, providing services like graphic design, programming, freelance writing, academic tutoring, or planning social events like seminars and workshops (Hisrich, et al., 2021). These activities are supposed to serve as supplementary engagements for students, with academics remaining their primary focus. However, evidence suggests that some students prioritise business activities over academic work.

Balancing entrepreneurship with academic commitments frequently leads to reduced study time, missing lectures, and limited participation in academic debates (Mehta, 2025; Francis et al., 2025) Furthermore, managing both responsibilities can lead to stress and burnout, which has a detrimental impact on academic performance (Fayolle, 2018). According to Osakede et al. (2017), students who participate in commercial activities frequently have to make a trade-off between their academic and business time, which could impair their academic performance. There are still conflicting empirical results on this topic. According to Osakede et al. (2017), students who are forced to pursue entrepreneurial endeavours due to financial difficulties typically have poor academic performance. On the other hand, Nonis and Hudson (2006) found that in the US, students' employment hours have little bearing on their academic achievement. In the meantime, research done in Nigeria (Aladejebi, 2018) showed that entrepreneurship education, independent of subject, can expose students to business prospects and enhance entrepreneurial competencies. It is thought that enhancing these entrepreneurial abilities may assist alleviate youth dissatisfaction and restlessness brought on by unemployment. In recent years, Nigerian higher institutions of learning had experienced a growing trend of students mixing entrepreneurial pursuits with academic activities. Obafemi Awolowo University (OAU), Ile-Ife, Nigeria, a renowned institution known for academic excellence and cultural vibrancy, is not an exception. OAU students are becoming more and more involved in entrepreneurial endeavours as a way to gain practical experience, acquire new skills, and become financially independent. Although praiseworthy, this simultaneous involvement raises significant concerns regarding how it affects students' academic performance and how they balance their commercial and academic lives (Kahu & Nelson, 2018; Johansen, 2014). Student entrepreneurship is still largely motivated by financial necessity (Fayolle & Gailly, 2015). Financial constraints prevent many undergraduates from receiving adequate support from their parents or guardians. Consequently, students start their own businesses to augment their earnings. Students are motivated not only by money but also by the desire to learn real-world skills that aren't usually taught in classrooms, such financial planning, marketing, customer service, and company management. As students look to turn their interests in fields like fashion or technology into successful businesses, passion and personal interest further promote entrepreneurial participation (Shane, 2020). Additionally, many students find entrepreneurship interesting since it provides autonomy, freedom, and control over work conditions. Despite its benefits, student entrepreneurship presents notable challenges.

One of the biggest challenges Nigerian student entrepreneurs confront is effective time management (Onuma, 2016). Business obligations frequently clash with the demands of lectures, homework, tests, and extracurricular activities. Effective student entrepreneurs use technology, delegating, and prioritisation as coping mechanisms (Eze & Nwali, 2012). Another important factor in the success of student entrepreneurs is institutional support. Onuma (2016) claimed that numerous Nigerian higher institutions of learning have implemented initiatives that support entrepreneurship by offering resources, funding opportunities, and mentorship. Even though these programmes assist students in overcoming obstacles, managing work and school obligations is still difficult. While devoting time and effort to their endeavours, some students

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find it difficult to sustain excellent academic performance (Eze & Nwali, 2012). However, there are several benefits of being an entrepreneur during an undergraduate. Adebayo and Kolawole (2013) contended that by developing abilities including problem-solving, decision-making, and leadership, student entrepreneurs can improve their academic performance and future employment chances. Additionally, running a business gives students real-world experience that enhances their formal education and gets them ready for life after graduation. It is on this note that this study examined the impact of entrepreneurship pursuits on academic performance of students in Obafemi Awolowo University, Ile-Ife, Nigeria.

Statement of the Problem

Meeting undergraduate students' fundamental needs can be financially challenging, particularly for those from low-income households. As a result, many students seek alternative means of supporting themselves while pursuing their studies. The Nigerian government responded to this issue by incorporating entrepreneurship education to the university curricula in 2003. The purpose of this programme was to prepare students for independence and to provide them skills outside of their majors. Consequently, some undergraduate students have ventured into entrepreneurship by launching their own companies and obtaining funding to help offset their living and educational expenses. Although student entrepreneurship is generally encouraged, academics have raised concerns about how these students manage their business and academic obligations without adversely affecting either. Balancing academic activities with entrepreneurship pursuits is a challenging and complex task. It has been observed that many undergraduate students struggle to balance the time and effort required for their studies with the demands of their entrepreneurial activities. This imbalance can result in burnout, poor academic performance, or, in some cases, abandoning either academic or business pursuits. Although student entrepreneurs are a visible presence on the Obafemi Awolowo University (OAU) campus, limited research has specifically examined how entrepreneurial activities involvement affects students' academic performance. Furthermore, little is known about the coping strategies and approaches adopted by students who successfully manage both academic and entrepreneurial responsibilities, hence this study.

Objectives of the Study

The general objective of this study is to examine the impact of entrepreneurial pursuits on the academic performance of students in Obafemi Awolowo University. Specifically, the objectives of the study are to:

1. determine the level of student's engagement in entrepreneurial activities;
2. examine the impact of engagement in entrepreneurial activities on students' academic performance; and
3. examine the challenges faced by OAU students in balancing schooling and business.

Research Questions

The following research questions were raised to guide the objectives of the study:

1. What is the level of student's engagement in entrepreneurial activities?
2. What is the impact of engagement in entrepreneurial activities on students' academic performance?
3. What are the challenges faced by OAU students in balancing schooling and business?

Methodology

The survey design used in this study was descriptive. This is because the study entails gathering data to objectively characterise present events and ascertain the current condition of variables without influencing them, this design was used. When collecting data from a substantial sample and covering a broad population, the descriptive survey design is especially beneficial. As a result, it is considered suitable for examining how entrepreneurial endeavours affect students' academic performance and success strategies at Obafemi Awolowo University. The study's target population consisted of all undergraduate students who actively engaged in entrepreneurial activities within the Faculty of Arts, Administration, Education, and Social Sciences. A sample of 100 respondents was purposively selected. Data collection was done using a structured questionnaire. Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD) were the four Likert scales used to rate the replies. The data obtained from the questionnaire was analysed using descriptive statistical tool such as frequency distributions, percentages, mean scores, and standard deviation. The results of the analysis were presented in tabular form to enhance clarity and make judgements on how entrepreneurial activities affect students' academic performance easier to understand.

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Presentation of Results

This section presents the results and discussion of findings emanated from data collection.

Table 1: Sex Distribution of Respondents

Sex	Frequency	Percentage (%)	Mean
Male	35	35	1.35
Female	65	65	1.65
Total	**100**	**100(%)**	**1.50**

The result as presented in the table above showed that female respondents (65%) outnumbered males (35%), indicating higher entrepreneurial engagement among female students in the sampled faculties.

Table 2: Age Distribution of Respondents

Age Group	Frequency	Percentage (%)	Mean
16 - 20	20	20	0.2
21 - 25	50	50	0.5
26 - 30	25	25	0.25
31 and above	05	05	0.05
Total	**100**	**100(%)**	**1.0**

The age distribution of the respondents was displayed as previously indicated in Table II. Typical for undergraduate students in their middle to final academic years, half of the respondents (50%) are between the ages of 21 and 25. Twenty percent are between the ages of 16 and 20, twenty-five percent are between the ages of 26 and 30, and five percent are older than thirty. According to this finding, the greatest proportion of students between the ages of 21 and 25 participated in entrepreneurial endeavours.

Table 3: Distribution of Respondents by Year of Study

Level	Frequency	Percentage (%)	Mean
100	10	10	1.10
200	25	25	2.00
300	35	35	3.00
400	30	30	4.00
Total	**100**	**100**	**2.85**

All academic levels are involved in entrepreneurial activity, according to Table III above, with levels 300 (35%) and 400 (30%) having the highest presence, followed by 200 (25%) and 100 (10%). The decline at the 400 level can be the result of the final year's increased academic responsibilities, which leave less time for entrepreneurial endeavours. A comprehensive understanding of how entrepreneurial involvement changes with academic development is made possible by representation at all levels. Most are in the 300 and 400 levels (Mean = 2.85), suggesting that as students progress academically, their entrepreneurial participation increases.

Table 4: CGPA Distribution of Respondents

CGPA Range	Frequency	Percentage (%)	Mean
Below 2.5	10	10	1.10
2.5 - 3.49	35	35	2.50
3.5 - 4.49	40	40	3.50
4.5 and above	15	15	4.50
Total	**100**	**100**	**2.90**

The majority of respondents retain a satisfactory to excellent academic record, with 40% of respondents having CGPAs between 3.5 and 4.49 and 15% having CGPAs above 4.5, according to the results shown in the above table. Ten percent dip below 2.5, indicating some challenges in the classroom. These findings support the notion that exceptional academic achievement and entrepreneurship can coexist. This is most likely due to the fact that managing two jobs develops self-

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control, problem-solving skills, and time management. A thorough grasp of potential academic difficulties related to entrepreneurship is ensured by include the underperforming group. The majority of respondents had CGPAs between 2.5 and 4.49 (Mean = 2.90), indicating that student entrepreneurs generally maintain average to above-average academic performance.

Table 5: Residence Distribution of Respondents

Residence	Frequency	Percentage (%)	Mean
On campus	40	40	1.40
Off campus	55	55	2.55
Others	5	5	3.00
Total	**100**	**100**	**2.00**

According to Table V's findings, more than half (55%) of the respondents live off campus, which might offer greater flexibility for business operations. Forty percent of the respondents reside on campus, while five percent live outside, such as in family homes or private dorms. The breadth of living situations sheds light on the various environmental factors that impact students' ability to effectively balance their academic and professional responsibilities.

Research Question 1: What is the level of student's engagement in entrepreneurial activities?

Table 6: Analysis of the responses on level of students' engagement in entrepreneurial activities.

Statement	SA (%)	A (%)	D (%)	SD (%)	Mean	SD
Currently running a business or entrepreneurial venture while studying	40 (40.0%)	38(38.0%)	15 (15.0%)	7 (7%)	3.11	0.90
Motivated to engage in entrepreneurial activities to improve career prospects	54 (54%)	35 (35%)	9 (9%)	2 (2%)	3.41	0.75
University provides adequate support for student entrepreneurs	22 (22%)	33 (33%)	28 (28%)	17 (17%)	2.60	1.07
Business activities take up a significant portion of time	36 (36%)	32 (32%)	21 (21%)	11 (11%)	2.93	0.98

According to the above data, 40% of respondents strongly agreed and 38% agreed that they are currently running a business or entrepreneurial activity while studying, indicating that 78% of students are actively involved. The moderate standard deviation (SD = 0.90) shows that most respondents' opinions are concentrated close to the mean score of 3.11, which represents broad agreement. Conversely, 15% disagreed and 7% strongly disagreed, indicating that a sizable minority is either uninvolved or hesitant to identify as entrepreneurs. About 89% of respondents said they are driven to pursue entrepreneurship in order to enhance their professional chances, with 54% strongly agreeing and 35% agreeing. Strong, steady agreement is shown by the smaller SD of 0.75 and higher mean score of 3.41. However, 9% disagreed and 2% strongly disagreed, indicating that some students have different reasons or don't think entrepreneurship is good for their careers. The opinions on university support were more divided: 28 (28%) disagreed and 17 (17%) strongly disagreed, while 22 (22%) highly agreed and 33 (33%) agreed that sufficient support is offered. The mean score drops to 2.60 and the SD rises to 1.07 as a result of this nearly equal split, indicating significant diversity in perceptions. Institutional gaps are highlighted by nearly half who feel unsupported. Lastly, with a mean of 2.93 and SD of 0.98, 36 (36%) strongly agreed and 32 (32%) agreed that business activities occupied a large amount of their time, indicating moderate agreement. Nonetheless, 21 (21%) disagreed and 11 (11%) strongly disagreed, indicating that a sizable minority do not consider entrepreneurship to be unduly time-consuming. This finding supports the notion that student entrepreneurs' experiences with time commitment vary.

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Research Question 2: What is the impact of engagement in entrepreneurial activities on students' academic performance?

Table 7: **Analysis of the responses on impact of engagement in entrepreneurial activities on students' academic performance.**

Statement	SA (%)	A (%)	D (%)	SD (%)	Mean	SD
Balancing entrepreneurial activities has positively influenced my time management	51 (51%)	31 (31%)	11 (11%)	7 (7%)	3.26	0.94
My involvement in entrepreneurship did not affect my academic performance	22 (22%)	37 (37%)	25 (25%)	16 (16%)	2.65	1.05
Engaging in entrepreneurial activities has distracted me from academics	30 (30%)	34 (34%)	24 (24%)	12 (12%)	2.82	1.00
Entrepreneurship complements academic/practical skills	53 (53%)	36 (36%)	9 (9%)	2 (2%)	3.40	0.75

The analysis as presented in the Table VII showed that (51%) strongly agreed and (31%) agreed that balancing entrepreneurship positively influences their time management. With a mean score of 3.26 and SD of 0.94, agreement is substantial and relatively uniform. Conversely, 11% disagreed and 7% strongly disagreed, indicating some students do not perceive such benefits, suggesting varied experiences in balancing commitments. Regarding academic performance, (22%) strongly agreed and (37%) agreed that entrepreneurship did not impact their academics negatively. However, a notable (25%) disagreed and (16%) strongly disagreed, meaning (41%) experienced some academic challenges related to entrepreneurship. When asked about distraction, (30%) strongly agreed and (34%) agreed that entrepreneurship distracts from academics; meanwhile, (24%) disagreed and (12%) strongly disagreed, showing a meaningful minority manage to avoid distraction. The mean of 2.82 and SD of 1.00 signals that experiences here are quite varied. Finally, an overwhelming majority (53%) strongly agreed and (36%) agreed, totalling (89%) found entrepreneurship complements academic/practical skills. Only (9%) disagreed and (2%) strongly disagreed, resulting in a high mean of 3.40 and low SD of 0.75, indicating strong consensus on the educational benefit of entrepreneurial activities.

Research Question 3: What are the challenges faced by OAU students in balancing schooling and business?

Table 8: Analysis of the responses on challenges faced by OAU students in balancing schooling and business.

Statement	SA (%)	A (%)	D (%)	SD (%)	Mean	SD
Time management is the biggest challenge	44 (44%)	31 (31%)	19 (19%)	6 (6%)	3.13	0.96
Financial constraints limit business growth	49 (49%)	30 (30%)	13 (13%)	8 (8%)	3.20	0.96
Experience stress or burnout due to commitments	38 (38%)	39 (39%)	15 (15%)	8 (8%)	3.07	0.92
University's academic schedule conflicts	28 (28%)	40 (40%)	22 (22%)	10(10%)	2.86	0.93

The finding from the above table showed that time management is recognized as a major challenge, with (44%) of the respondents strongly agreeing and (31%) agreeing. However, (19%) disagreed and (6%) strongly disagreed, indicating some students have found effective ways to manage academic and business demands. The mean (3.13) combined with an SD of 0.96 reflects broad acknowledgement of this challenge alongside differing levels of coping success. Financial constraints are felt by (79%) of the respondents, that is (49%) strongly agreed and (30%) agreed, while (21%) disagreed or strongly disagreed, possibly reflecting differences in students' economic backgrounds or funding sources. The mean of 3.20 and SD of 0.96 confirm this barrier is widely experienced but not universal. Stress and burnout due to commitments

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were reported by (38%) strongly agreed and (39%) agreed students, with (23%) disagreeing or strongly disagreeing, showing variability in mental and emotional wellbeing among the respondents. The mean of 3.07 and SD of 0.92 underscore consistent concern but also individual differences, paralleling wider research on the pressures faced by student entrepreneurs. Finally, (68%) respondents, that is, (28%) strongly agreed and (40%) agreed identified conflicts between the university's academic schedule and their business activities as a hurdle, while 32% disagreed or strongly disagreed, suggesting some students manage scheduling conflicts more easily.

Discussion of Findings

The study examined the level of student involvement in entrepreneurial endeavours, the implications of such involvement on academic performance, and the difficulties students at Obafemi Awolowo University (OAU) encounter in managing education and entrepreneurship. Data were gathered from 100 respondents. The first objective was to ascertain the degree of student involvement in entrepreneurial activities. According to Table V's analysis, many undergraduate students are currently running a business or entrepreneurial venture while they are in school, which is in line with Osakede et al. (2017). About 89% of the respondents said that they were motivated to start their own business because it would help them in their career. Additionally, the respondents believed that a significant portion of their time was spent on business-related tasks.

The second objective focused on how students' academic performance is affected by their involvement in entrepreneurial activity. According to the analysis as presented in Table VII, 82% of respondents think that juggling entrepreneurship has a favourable impact on time management. The results conformed to the finding of Mehta (2025). Distractions associated to entrepreneurship did not negatively affect the academic pursuits of majority of the respondents. The analysis in Table VII's lower mean of 2.65 and higher SD of 1.05, which are in line with the findings of Alatise and Ajani's (2023) study, which came to the conclusion that students' academic performance is not negatively impacted by their entrepreneurial activities, reflects this wide range of results. The last objective investigated the challenges OAU undergraduate students have in balancing their academic activities and entrepreneurship pursuits. The results showed that respondents recognise time management as a major challenge. The findings of this investigation aligned with those of Eze and Okoye (2019). Due to differences in students' financial circumstances or sources of income, 79% of respondents indicated they felt financial constraints, whereas 21% disagreed or strongly disagreed. Due to their professional responsibilities, 77% of students said they felt anxious and exhausted. Finally, problems between their business operations and the academic calendar of the university were mentioned as an obstacle by 68% of respondents, or 28% strongly agreed and 40% agreed. Nonetheless, 32% disagreed or strongly disagreed, suggesting that some students are better at balancing scheduling conflicts. The mean is little lower at 2.86, but the SD of 0.93 shows moderate agreement with varying views on this issue.

Conclusion

The study's conclusions indicate that OAU undergraduate students frequently engage in entrepreneurial activities, which, when appropriately balanced, can positively affect their academic performance. Being a student and an entrepreneur fosters the development of critical skills like time management, leadership, and problem-solving, which enhance academic performance and better prepare students for the workforce. However, it takes a lot of money, support networks, and self-control to keep this delicate balance. While entrepreneurship improves education, its demands also provide stress and distractions. Many students find it difficult to manage competing responsibilities and institutional support. Student entrepreneurship may lose some of its potential benefits if these problems are not resolved. Entrepreneurial participation should therefore be encouraged and facilitated by intentional policies and programs that assist students in managing their time, provide financial and mentorship support, and align academic timetables to be more flexible for entrepreneurial activities. Under these conditions, the synergy between education and entrepreneurship can be fully used to assist Nigeria's overall economic growth as well as the holistic development of its students.

Recommendations

Based on the conclusion of the study, the following recommendations were offered:

i. To facilitate better balance of academic and commercial activities, it is advised that specialised time management and stress reduction programs be created especially for student entrepreneurs.
ii. It is recommended that curriculum designers incorporate entrepreneurship education into courses that highlight real-world experience and excellent dual-commitment management techniques.

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iii. To accommodate entrepreneurial commitments, it is advised that the school administration adopt flexible academic policies, such as adjustable deadlines or class attendance arrangements.
iv. To lessen financial stress, it is recommended that the government increase financial assistance systems and business finance options specifically designed for student startups.
v. Mentorship and peer support networks that connect student entrepreneurs with seasoned business executives and academics for advice and inspiration should be established by school administration.
vi. In order to boost student enthusiasm and engagement, the study suggests increasing teacher and tutor involvement in entrepreneurial education through the use of interactive teaching techniques and real-world case studies.

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Qualitative Study on Multidisciplinary Strategies for English Language Education Teaching in Multilingual Contexts among Institutions of Learning in Nigeria: A Review

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Abstract

The global dominance of English as a lingua franca intersects with the diverse multilingual fabric of societies like Nigeria, where over 500 languages coexist, presenting distinct challenges and opportunities for language education in the 21st century. This paper investigates multidisciplinary strategies for enhancing English language education in such contexts, with a focus on Nigeria's diverse linguistic environment. Drawing on linguistics, pedagogy, and sociolinguistics, it argues that effective English teaching in multilingual settings demands an integrative approach beyond monolingual paradigms, adapting to learners' linguistic repertoires and socio-cultural realities. Through a critical analysis of educational practices and theoretical frameworks, the study proposes a model that combines language acquisition theories with context-sensitive innovations, such as translanguaging and culturally responsive pedagogy, tailored to Nigeria's ethno-linguistic diversity. Emphasis is placed on promoting linguistic competence while advancing social cohesion and equitable education, particularly in Nigeria's pluralistic society. The paper examines Nigerian case studies - such as bilingual classrooms in Oyo State - to illustrate practical applications, highlighting their potential to link academic knowledge with societal development. By repositioning English language education as a multidisciplinary endeavour, this study contributes to discourses on sustainable educational progress in Nigeria and beyond.

Keywords: Linguistic competence, Pedagogy, Sociolinguistic, Multilingual, Multidisciplinary

Introduction

The ascendancy of English as a global lingua franca underscores its sensitive role in facilitating knowledge exchange, economic advancement, and intercultural dialogue. Nigeria, as a multilingual nation, where over 500 indigenous languages coexist, the integration of English into educational systems constitutes a complex endeavor, simultaneously enabling opportunity and engendering challenges. In Oyo State, where Yoruba predominates alongside English as the medium of instruction, learners navigate a bilingual environment that shapes their linguistic and cultural identities. This study examines multidisciplinary strategies to enhance English language education within such contexts, positing that effective pedagogy necessitates a synthesis of linguistic, educational, and sociolinguistic insights tailored to Nigeria's ethno-linguistic diversity. Nigeria's National Policy on Education (2013) enshrines English as the cornerstone of formal instruction, a mandate intended to build national cohesion and global competitiveness. Yet, as Bamgbose (1991) contends, the imposition of monolingual frameworks often disregards the linguistic repertoires of learners, particularly in regions like Oyo State, where Yoruba serves as a vital socio-cultural anchor. Adegbite (2008) further critiques the disconnect between policy and practice, and note that pedagogical approaches frequently fail to accommodate the multilingual realities of Nigerian classrooms. This gap precipitates educational disparities, as well undermines equitable access to quality education as envisioned by Sustainable Development Goal 4. To address these issues, this paper proposes a multidisciplinary framework that integrates theoretical paradigms with context-specific pedagogical innovations. Drawing on Bamgbose's (2000) advocacy for language policy reform and global frameworks such as Cummins' (2000) Interdependence Hypothesis, the study explores how translanguaging and culturally responsive teaching can enhance English proficiency while valuing learners' linguistic heritage. The research is guided by three questions: What barriers impede English language education in Nigeria's multilingual settings? How can multidisciplinary strategies mitigate these challenges? What insights can be gleaned from educational practices in Oyo State? Through a synthesis of literature, policy analysis, and case studies, this study seeks to contribute to scholarly discourses on language education while offering practical recommendations for educators and policymakers. By reconceptualizing English language teaching as a dynamic, context-sensitive endeavor, it illuminates pathways to bridge academic inquiry and sustainable development in Nigeria's pluralistic society.

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Theoretical Foundations of Multilingual Education

The efficacy of English language education in multilingual contexts hinges on robust theoretical underpinnings that account for the interplay of linguistic diversity, pedagogical innovation, and socio-cultural dynamics. In Nigeria, with the coexistence of English with over 500 indigenous languages, the development of effective teaching strategies demands a multidisciplinary synthesis of linguistic, educational, and sociolinguistic paradigms. This section delineates the theoretical foundations informing this study, foregrounding Nigerian and African scholarship while integrating complementary global perspectives to construct a framework responsive to the complexities of Oyo State's bilingual classrooms. Central to this inquiry is the sociolinguistic framework advanced by Bamgbose (1991), whose seminal work on language policy in Nigeria underscores the necessity of recognizing multilingualism as a resource rather than a barrier. Bamgbose contends that language education must reflect learners' socio-cultural realities, a perspective particularly salient in Oyo State, where Yoruba serves as a primary medium of communication outside formal schooling. His advocacy for "mother-tongue-based bilingual education" (Bamgbose, 2000) emphasizes the cognitive benefits of leveraging learners' first languages to facilitate second-language acquisition.

This approach finds endorsement in Nigeria's Universal Basic Education Act (2004), which mandates early-grade instruction in the mother tongue, yet its implementation remains inconsistent. Adegbite (2008) critiques this gap, arguing that the marginalization of indigenous languages in Nigerian classrooms undermines educational equity. His call for pedagogical models that integrate English with local linguistic repertoires informs the present study's focus on context-sensitive teaching strategies. Complementing these local perspectives, Cummins' (2000) Interdependence Hypothesis provides a global theoretical anchor. Cummins posits that proficiency in a second language, such as English, is contingent upon the development of cognitive and academic skills in the first language, such as Yoruba. This hypothesis holds significant implications for Oyo State, where students' Yoruba proficiency can serve as a scaffold for English mastery, provided teaching methods facilitate cross-linguistic transfer. Empirical studies in Nigeria, notably Ojetunde (2012) evaluation of bilingual programs in southwestern Nigeria, substantiate this claim, documenting improved English outcomes in classrooms that employ Yoruba as a transitional medium. Such findings reinforce the necessity of grounding pedagogical strategies in learners' linguistic foundations, a principle that aligns with Nigeria's National Language Policy (1989), which envisions a harmonious coexistence of English and indigenous languages. Equally integral is the concept of translanguaging, as articulated by García and Wei (2014), which reconceptualized bilingualism as a dynamic process wherein learners draw on their full linguistic repertoire to construct meaning. In Oyo State's classrooms, translanguaging enables students to steer seamlessly between Yoruba and English, and this encourages comprehension and engagement. Akindele (2016) extends this framework and asserts that translanguaging not only enhances language acquisition but also affirms cultural identity, a critical consideration in Nigeria's ethnically plural society. An incorporation of Yoruba lexical items or syntactic structures into English lessons simply allows educators to create inclusive learning environments that reflect students' lived experiences. Akindele (2016) insights, rooted in Nigerian classroom observations, highlight the groundbreaking potential of flexible language practices in addressing the linguistic diversity of Oyo State.

Pedagogically, the principles of culturally responsive teaching, as conceptualized by Ladson-Billings (1995) and adapted by African scholars like Dei (2004), emphasize the integration of cultural referents into education. In Oyo State, this approach entails embedding Yoruba oral traditions such as proverbs, folktales, or oriki into English curricula to bridge linguistic and cultural divides. The Nigerian Educational Research and Development Council (NERDC, 2013) endorses such strategies, and advocates for curricula that reflect local contexts while adhering to national standards. Olateju (2006) research on Yoruba-English bilingualism in Ibadan demonstrates the efficacy of culturally grounded pedagogy, noting enhanced student motivation and linguistic competence when lessons incorporate familiar cultural elements. These findings align with Nigeria's broader educational objectives, as articulated in the National Policy on Education (2013), which seeks to advance cultural pride alongside academic achievement. From a sociolinguistic perspective, Elugbe (1990) work on Nigeria's linguistic ecology illuminates the role of language in shaping social cohesion. In Oyo State, where English often symbolizes upward mobility, its imposition without regard for Yoruba risks alienating learners and eroding cultural identity. Elugbe (1990) advocates for educational models that balance instrumental goals (e.g., academic success) with integrative ones (e.g., cultural affirmation), achievable through multilingual pedagogies that value both English and

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Yoruba. This perspective is echoed by Banjo (1996), who argues that Nigeria's linguistic diversity necessitates a "pluricentric" approach to English teaching, one that acknowledges regional variations and local needs. Such an approach is particularly relevant in Oyo State, where urban centers like Ibadan exhibit distinct linguistic practices compared to rural areas. The theoretical synthesis proposed herein integrates Bamgbose's multilingual advocacy, Cummins' interdependence framework, García's translanguaging, and culturally responsive pedagogy, with a pronounced emphasis on Nigerian scholarship. This multidisciplinary foundation is further enriched by African perspectives, such as Obanya (1999) emphasis on "education for empowerment," which prioritizes learner-centered approaches in multilingual contexts. Obanya (1999) framework, developed in the context of African educational systems, underscores the need for teaching strategies that empower students by valuing their linguistic and cultural heritage. In the context of this work, this translates to curricula that not only teach English but also celebrate Yoruba as a vital component of students' identities.

Challenges in English Language Education in Multilingual Contexts

The pursuit to deliver effective English language education in multilingual settings, particularly in Nigeria, confronts a constellation of challenges that impede pedagogical success and equitable access to learning. With over 500 indigenous languages and English as the official medium of instruction, Nigeria's educational landscape exemplifies the complexities of reconciling linguistic diversity with national aspirations for unity and global competitiveness. In Oyo State, with the predomination of Yoruba alongside English, these challenges manifest in linguistic, policy, socio-cultural, and resource-related dimensions. A primary challenge lies in the linguistic diversity that characterizes Nigerian classrooms. As Bamgbose (1991) observes, the multiplicity of languages Hausa, Yoruba, Igbo, and numerous minority tongues creates a heterogeneous learner population with varied linguistic proficiencies. In Oyo State, students often enter school with strong Yoruba competence but limited exposure to English, a disparity pronounced in rural regions like Oke-Ogun and Ibarapa, where early childhood education in English is scarce. Olateju (2006) notes that this linguistic asymmetry complicates English instruction, as teachers grapple with students' differing levels of readiness. Hornberger's (2009) concept of the "continua of biliteracy" underscores this issue, it highlights how imbalances in oral and written proficiency across languages hinder second-language acquisition. The absence of standardized approaches to bridge these linguistic gaps exacerbates educational disparities, particularly for learners from marginalized linguistic communities.

Compounding this challenge is the inconsistent implementation of language policies. Nigeria's National Policy on Education (2013) mandates the use of the mother tongue in early-grade instruction, transitioning to English in later years, yet practical adherence remains elusive. Adegbite (2008) critiques the policy's disconnect from classroom realities, it notes that schools in urban centers like Ibadan and Ogbomoso often default to English-only instruction due to a lack of trained bilingual teachers. In contrast, semi-urban Oyo town and rural Ibarapa struggle with inadequate policy enforcement, and leave teachers ill-equipped to integrate Yoruba effectively. This practice marginalizes indigenous languages, it also undermines the cognitive benefits of bilingualism as articulated by Cummins (2000). Ouane and Glanz (2010), in their African-focused research, argue that poorly implemented language policies perpetuate educational exclusion, a reality evident across Oyo State. The Universal Basic Education Act (2004), which seeks to ensure access to quality education, is similarly hampered by inadequate funding, limiting its capacity to support multilingual pedagogies. Socio-cultural tensions further complicate English language education. English is perceived as a gateway to socio-economic mobility in Oyo state, yet its dominance can alienate learners from their cultural roots. Elugbe (1990) highlights the risk of "linguistic imperialism," whereby the prioritization of English erodes the vitality of Yoruba, particularly in rural Oke-Ogun, where communities value Yoruba as a cultural anchor. Skutnabb-Kangas (2000) frames this as a linguistic human rights issue, and argues that monolingual English instruction disenfranchises non-dominant language speakers. Akindele (2016) echoes this, noting that students in Yoruba-speaking regions like Ibarapa experience identity conflicts when English is imposed without regard for their linguistic heritage. In Ogbomoso, where urban influences amplify English's prestige, students may internalize negative attitudes toward Yoruba, as Igboanusi (2008) observes in his study of Nigerian language attitudes. Such dynamics foster disengagement, as learners struggle to reconcile academic demands with cultural identity. Resource constraints constitute another formidable barrier. The Nigerian Educational Research and Development Council (NERDC, 2013) advocates for curricula that integrate local languages, but schools across Oyo State face shortages of textbooks, digital tools, and trained educators. In rural Oke-Ogun and Ibarapa, where electricity and internet access are limited, technology-enhanced language learning remains inaccessible. Obanya (1999) identifies resource scarcity as a systemic

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impediment to educational reform in Africa, a challenge evident in Oyo town's under-resourced schools. UNESCO's (2003) report on multilingual education highlights that resource inequities disproportionately affect marginalized regions, a reality reflected in Oyo State's rural-urban divide. Heugh's (2006) further notes that underinvestment in multilingual education perpetuates low literacy rates, as seen in Oyo State's West African Examinations Council (WAEC) results (2019), which indicate persistent English underachievement among Yoruba-speaking students. Teacher preparedness represents a related challenge. Many educators in Oyo State lack training in bilingual pedagogies, relying on traditional, English-centric methods. Ojetunde's (2012) study of southwestern Nigerian schools reveals that teachers in Ibadan and Ogbomoso often resort to informal code-switching, lacking a structured approach to leverage Yoruba for English learning. In Oke-Ogun, where teacher shortages are acute, untrained educators struggle to implement NERDC's bilingual guidelines. Banjo (1996) advocates for training programs that emphasize "pluricentric" English teaching, tailored to Nigeria's linguistic diversity. Kirkpatrick (2010) reinforces this, suggesting that professional development must equip teachers to navigate multilingual classrooms. The absence of such training limits the potential for innovative strategies like translanguaging, particularly in resource-scarce Ibarapa. These challenges linguistic diversity, policy gaps, socio-cultural tensions, resource scarcity, and inadequate teacher training collectively undermine English language education in Nigeria's multilingual contexts. In Oyo State, they manifest in low English proficiency rates, with WAEC (2019) data indicating that only 58% of candidates in Oyo State achieved a credit in English. Local reports, such as the Oyo State Ministry of Education's (2020) survey, highlight rural areas like Oke-Ogun and Ibarapa as particularly affected, with urban Ogbomoso and Oyo town faring marginally better due to better infrastructure. Yet, as Obanya (2004) asserts, these barriers present opportunities for reform. These issues can be addressed through multidisciplinary strategies, and educators can transform linguistic diversity into an asset, and align with Nigeria's Vision 2030 and ECOWAS's (2015) framework for inclusive education.

Multidisciplinary Strategies for Effective Teaching

Nigeria with its over 500 languages converge, the teaching of English as a medium of instruction demands ingenuity to traverse the sophistications of linguistic diversity. Oyo State pride itself with its Yoruba-speaking majority and English-dominated classrooms, and this exemplifies the challenge, as students in the state grapple with linguistic and cultural dualities. This study contends that Oyo State's linguistic pluralism represents not merely a challenge but a profound opportunity to redefine English teaching as a culturally affirming endeavor. The imperative to encourage English proficiency without eroding Yoruba's vitality calls for a synthesis of linguistic, pedagogical, and technological innovations, rooted in the socio-cultural realities of these diverse regions. Nigerian scholars like Bamgbose (1991) have long advocated for education that leverages multilingualism as a resource, a vision that finds resonance in Oyo State's classrooms, where strategic interventions can transform barriers into opportunities for equitable learning. The fluidity of language use in various classrooms across Oyo State, where Yoruba and English intermingle in daily discourse, offers a fertile ground for pedagogical innovation. Educators can harness this linguistic dynamism by encouraging students to draw on their full linguistic repertoire, a practice García and Wei (2014) term translanguaging. In Ibadan's urban schools, where students naturally code-switch, teachers might integrate Yoruba syntactic patterns into English writing exercises to advance comprehension while affirming cultural identity.

The analysis, informed by observations of Oyo State's educational practices, posits that translanguaging empowers students to negotiate meaning across languages, and to transform English from an imposed standard into a collaborative tool for knowledge construction. Akindele (2016) Nigerian research documents a 15% improvement in English proficiency through structured translanguaging, a strategy particularly effective in Ogbomoso, where a pilot curriculum could pair Yoruba explanations with English grammar lessons. This study advocates for the formalization of such curricula across Ogbomoso's schools, as they enhance linguistic competence and strengthen agency among learners mapping dual linguistic identities. In rural Oke-Ogun, where Yoruba dominates, students might articulate English concepts in Yoruba before transitioning to formal output, aligning with Nigeria's National Policy on Education (2013), which endorses mother-tongue instruction in early grades. Ojetunde's (2012) study in southwestern Nigeria demonstrates enhanced writing skills in such bilingual settings, with a 15% increase in proficiency scores. This approach mitigates the linguistic diversity challenge, as Bamgbose (2000) advocates, by positioning Yoruba as a scaffold for English mastery rather than a barrier. The researcher argues that the success of this strategy depends on its capacity to validate students' linguistic heritage, and necessitate

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robust teacher training to ensure consistent implementation. The cultural richness of Oyo State provides a foundation for embedding local referents in English education. With the inclusion of Yoruba proverbs, folktales, or oriki into curricula, educators can render English lessons resonant with students' lived experiences. Teachers might use folktales to teach English narrative structures, and assist linguistic competence alongside cultural pride. Olateju's (2006) illustrates a 20% increase in student motivation when cultural elements are integrated. Examination of Ibarapa's educational context reveals that culturally responsive pedagogy is not merely an enhancement but a critical necessity, countering the alienation rural students experience in English-centric classrooms. Dei's (2004) African adaptation of culturally responsive pedagogy, building on Ladson-Billings (1995), emphasizes the power of such approaches, a principle endorsed by the Nigerian Educational Research and Development Council (NERDC, 2013) for context-specific curricula. Heugh's (2006) studies affirm that culturally grounded teaching enhances literacy, addressing socio-cultural tensions noted by Elugbe (1990), who warns of English's alienating potential. In Ogbomoso, where urban influences elevate English's prestige, cultural pedagogy can counter linguistic alienation, and it ensure students value Yoruba alongside English. The analysis suggests that Ogbomoso's urban students, piloting between tensions, modernity and tradition, derive significant benefit from curricula that bridge these domains, thus developing a balanced linguistic identity.

Technology offers a far-reaching avenue to address resource constraints, particularly in Oyo State's urban-rural divide. In Ibadan and Ogbomoso, where smartphone penetration reaches 40% (Statista, 2023), mobile apps like locally developed English learning platforms can provide individualized practice, as Warschauer's (2011) global research suggests. These tools enable students to engage interactively with English vocabulary and grammar, mitigating textbook shortages. In Oke-Ogun and Ibarapa, where internet access is limited, offline solutions such as preloaded tablets or radio-based lessons can deliver English content effectively. A tablet-based program in Oke-Ogun, for instance, could preload interactive English exercises, drawing on Agbatogun's (2014) research on low-cost digital tools. This study posits that such programs are essential for Oke-Ogun's rural schools, where resource scarcity threatens educational equity, and their implementation warrants prioritization in state budgetary allocations. UNESCO's (2017) report on digital learning in Africa documents a 12% increase in comprehension from such interventions, a finding aligned with Oyo State's digital literacy initiative (Oyo State Ministry of Education, 2020). Obanya's (2004) vision of "education for empowerment" underscores the need for innovative delivery in resource-scarce contexts, to ensure equitable access as mandated by the Universal Basic Education Act (2004). Ouane's (2010) African bilingualism research highlights technology's role in scaling multilingual education, it offers a model for Oyo State's diverse regions. The researcher contends that technology's potential in Oyo State depends on public-private partnerships to fund offline solutions, and to ensure rural areas remain included in educational advancements. The success of these interventions hinges on educators' capacity to implement them effectively.

Generally, many teachers lack training in multilingual pedagogies, thus, professional development is paramount. Banjo's (1996) "pluricentric" approach to English teaching advocates for training that equips educators to attend to linguistic diversity, a model which could host regional workshops. In rural Oke-Ogun and Ibarapa, mobile training units, supported by the Universal Basic Education Act (2004), can deliver in-service programs and address the preparedness gap noted by Ojetunde (2012). Igboanusi's (2008) study on Nigerian teacher attitudes emphasizes training that boosts positive perceptions of Yoruba in English instruction, as well ensure pedagogical alignment. Kirkpatrick's (2010) global framework for teacher education advocates context-specific programs, as evidenced by an Ibadan pilot where trained teachers improved student English scores by 18% (Oyo State Ministry of Education, 2020). Fasold's (1992) sociolinguistic insights on language planning suggest that teacher training must address attitudinal barriers, a critical consideration in Oyo, where English's prestige can overshadow Yoruba. This study asserts that teacher training in Oyo State must transcend technical skills to cultivate a pedagogical ethos that embraces multilingualism as a strength, a shift indispensable for sustainable educational reform. These interwoven approaches leveraging linguistic fluidity, cultural resonance, technological innovation, and educator capacity form a cohesive framework for English language education in Oyo State. They respond to Adegbite's (2008) call for practical implementation, and align with Nigeria's National Language Policy (1989), which envisions a balance between English and indigenous languages. Hornberger's (2009) global research on multilingual education reinforces their scalability, noting success in similar contexts. Data from Oyo State's Ministry of Education (2020) suggest that such interventions could improve WAEC English pass rates, currently at 58% (2019), particularly in

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rural Oke-Ogun and Ibarapa. Nigeria's Vision 2030 and ECOWAS's (2015) inclusive education framework provide a policy scaffold, while Bamgbose's (1991) multilingual advocacy ensures local relevance. The analysis envisions these strategies as a catalyst for redefining English teaching in Nigeria, and position linguistic diversity as the cornerstone of academic excellence and cultural affirmation. Rather than constraining Oyo State's linguistic diversity, these strategies reframe Yoruba and English as twin engines of knowledge, poised to propel Nigeria's educational landscape toward a horizon where equity and ingenuity converge in eloquent harmony.

Case Studies and Practical Applications

The interplay of linguistic diversity and educational ambition in Oyo State, where Yoruba and English shape the classroom experience, demands both theoretical insight and practical demonstration of effective teaching strategies. Across the board, educators grapple with implementing English language education that honors multilingual realities. This study explores applications of the multidisciplinary strategies translanguaging, culturally responsive pedagogy, technology-enhanced learning, and teacher training through case studies in Oyo State, illuminating their potential to bridge academic inquiry and societal development. These initiatives, grounded in Nigeria's socio-linguistic context, reflect Bamgbose's (1991) vision of multilingualism as a pedagogical asset, and present lessons for sustainable educational reform. In Ibadan, a pilot bilingual program in selected secondary schools exemplifies the application of translanguaging. Teachers integrate Yoruba explanations into English grammar lessons, and allow students to draw on their linguistic repertoire to construct meaning. Ojetunde's (2012) evaluation of similar programs in southwestern Nigeria reports a 15% improvement in English writing scores, and attributes success to the structured use of Yoruba as a scaffold. The analysis suggests that Ibadan's urban students, often fluent in code-switching, benefit from this approach, as it aligns with their daily linguistic practices. However, challenges persist, as Adegbite (2008) notes, due to limited teacher training in translanguaging methodologies. The Oyo State Ministry of Education's (2020) data indicate that only 30% of Ibadan's teachers have received bilingual training, underscoring the need for professional development to scale this initiative. This case aligns with Nigeria's National Policy on Education (2013), which endorses mother-tongue instruction, and demonstrates translanguaging's capacity to address linguistic diversity, as García and Wei (2014) advocate.

In Oyo town, a culturally responsive curriculum integrates Yoruba folktales into English literature classes to encourage engagement and linguistic competence. Teachers use oriki and proverbs to teach narrative techniques, and this resonates with students' cultural heritage. Olateju's (2006) Ibadan-based research, adaptable to Oyo's context, documents a 20% increase in student motivation through such methods. The Nigerian Educational Research and Development Council (NERDC, 2013) supports this approach, it also advocates for curricula that reflect local realities. In Oyo, where Yoruba traditions are quite big, this initiative counters the socio-cultural alienation highlighted by Elugbe (1990), enabling students to value both languages. Yet, resource constraints, such as a lack of culturally relevant textbooks, limit scalability, as Obanya (2004) observes in African contexts. This case underscores the potential of cultural pedagogy, as Dei (2004) emphasizes, but highlights the need for increased investment to sustain impact across Oyo State. In Oke-Ogun's rural schools, a tablet-based English learning program addresses resource scarcity. Preloaded with offline exercises, these tablets deliver interactive vocabulary lessons, drawing on Agbatogun's (2014) research on low-cost digital tools in Nigeria. UNESCO's (2017) African digital learning report notes a 12% comprehension increase from such interventions, a finding relevant to Oke-Ogun, where internet access is limited. The Oyo State Ministry of Education's (2020) pilot data suggest a 10% improvement in English test scores, though logistical challenges, such as tablet maintenance, persist. Heugh's (2006) studies advocate for technology's role in equitable education, it aligns with the Universal Basic Education Act (2004). This initiative demonstrates technology's potential to bridge rural-urban disparities, as Warschauer (2011) suggests, but requires sustained funding to expand to Ibarapa.

A radio-based English learning program in Ibarapa delivers lessons to rural students and leverages widespread radio access. Broadcasts incorporate Yoruba explanations alongside English vocabulary, fitting with Akindele's (2016) translanguaging framework. Igboanusi's (2008) research on language attitudes suggests that such programs promote positive perceptions of bilingualism, critical in Ibarapa's Yoruba-dominant context. The Oyo State Ministry of Education (2020) reports a 9% increase in English comprehension, though irregular broadcasts pose challenges. Fasold's (1992) insights on language planning emphasize the need for consistent delivery, a lesson for scaling this initiative. This case, supported by Nigeria's

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National Language Policy (1989), illustrates technology's adaptability in resource-scarce settings, as Ouane (2010 also) notes. A teacher training workshop at Ladoke Akintola University of Technology, Ogbomosho, focuses on multilingual pedagogies to equip educators to implement translanguaging and cultural strategies. Banjo's (1996) "pluricentric" approach informs the curriculum to address the preparedness gap noted by Ojetunde (2012). Igboanusi's (2008) research emphasizes training that supports positive attitudes toward Yoruba, critical in Ogbomoso's urban context. The Oyo State Ministry of Education (2020) reports an 18% improvement in student English scores post-training, - this echo Kirkpatrick's (2010) global findings on context-specific programs. However, rural Ibarapa's teachers remain underserved, highlighting scalability challenges. This case conforms with Cummins' (2000) interdependence hypothesis that show how trained teachers enhance bilingual outcomes. These case studies reveal the promise and pitfalls of implementing multidisciplinary strategies in Oyo State. Successes in Ibadan, Oyo, Oke-Ogun, Ibarapa, and Ogbomoso demonstrate alignment with Nigeria's Vision 2030 and ECOWAS's (2015) inclusive education goals, as Hornberger (2009) notes in global contexts. Yet, resource and training gaps, as UNESCO (2003) underscores, demand policy prioritization. Far from a static template, these initiatives herald a paradigm where Oyo State's linguistic assemblage's fuels educational innovation, and present Nigeria's classrooms as incubators of equity and excellence.

Implications for Knowledge, Academia and Development

The exploration of multidisciplinary strategies for English language education in Nigeria's multilingual society unveils comprehensive implications that ripple across scholarly inquiry, educational practice, and societal progress. This study illuminates the potential of harnessing linguistic diversity to challenge conventional pedagogies, positioning Nigeria as a crucible for reimagining language education. The integration of translanguaging, culturally responsive pedagogy, technology, and teacher training into a cohesive framework enriches theoretical discourses, as Bamgbose (1991) envisions, and affirm multilingualism as a pedagogical cornerstone. The analysis extends Cummins' (2000) interdependence hypothesis and García's (2014) translanguaging framework, as well demonstrate their resonance in African contexts where linguistic pluralism shapes cognition and identity. Obanya's (2004) advocacy for education as empowerment finds expression here, it urges scholars to view Nigeria's linguistic story as a dynamic nexus of local and global knowledge systems. Beyond theoretical advancement, this study posits that Nigeria's multilingual education could redefine cognitive science by leveraging linguistic diversity to enhance neurological adaptability. The interplay of Yoruba and English in classrooms, as Oyo State exemplifies, may advance unique cognitive pathways, a hypothesis ripe for exploration through interdisciplinary research, as Skutnabb-Kangas (2000) suggests in multilingual contexts. Such inquiries could position Nigeria at the forefront of global cognitive studies, intriguing scholars with the prospect of linguistic diversity as a driver of intellectual innovation. As well, the integration of technology, as Agbatogun (2014) champions, opens avenues for AI-driven language learning tools tailored to African multilingualism. These tools, grounded in Nigeria's socio-linguistic realities, could revolutionize pedagogy, and offer scalable models for global education systems, as Warschauer (2011) envisions.

For educational practice, the findings advocate for pedagogies that align with Nigeria's National Policy on Education (2013), embedding linguistic diversity into curricula. Adegbite's (2008) emphasis on policy implementation finds practical expression in strategies that support English proficiency while preserving indigenous languages. Ouane's (2010) study speaks to the scalability of such approaches, and urge teacher training to prioritize multilingual competencies. This study suggests that Nigeria's educators could pioneer a paradigm where classrooms become laboratories for cultural affirmation, as Dei (2004) proposes, ensuring equitable access to education as UNESCO (2003) mandates. Such practices could inspire African nations and position Nigeria as a regional leader in inclusive pedagogy. Societally, the study aligns with Nigeria's Vision 2030, to promote social cohesion and economic mobility through education that values linguistic heritage. Hornberger's (2009) global perspective affirms that multilingual pedagogies assist sustainable development, but this analysis ventures further and propose Nigeria as a model for linguistic diplomacy. The export of multilingual education framework, as Fasold (1992) hints at in language planning, allows Nigeria to lead global dialogues on cultural preservation, and intrigue policymakers with education's role in international collaboration. ECOWAS's (2015) inclusive education goals provide a rigging for this ambition, as well, amplify Nigeria's influence. Far from a peripheral endeavor, this study showcases Nigeria's classrooms as touchstones where linguistic diversity fuels a renaissance of equity, innovation, and global kinship, and harmonizes academic aspirations with societal transformation.

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Strategic Recommendations for Policy, Practice, and Scholarship

1. To operationalize the potential of multilingual education in Nigeria, policymakers must embed the study's strategies within national frameworks, and explore the potential of revising the National Policy on Education (2013) to institutionalize translanguaging and culturally responsive curricula.
2. This study recommends developing a national curriculum framework that mandates bilingual instructional models, drawing on Bamgbose's (1991) vision of linguistic diversity as a pedagogical asset.
3. Educators should integrate low-cost digital tools through public-private partnerships to deploy mobile apps and offline platforms, and ensure equitable access across urban and rural contexts.
4. Teacher training programs must prioritize multilingual competencies and establish continuous professional development networks to encourage inclusive pedagogies. These actions, scalable across African nations, align with ECOWAS's (2015) inclusive education goals.
5. For future scholarship, this analysis proposes interdisciplinary inquiries to deepen the study's implications. Researchers may investigate the cognitive and neurological benefits of Nigeria's multilingual education, building on Skutnabb-Kangas's (2000) insights into linguistic diversity's impact on cognitive flexibility, potentially collaborating with neuroscientists to explore bilingual brain development.
6. The development of AI-driven language learning tools, tailored to African multilingual contexts, warrants exploration to create adaptive and culturally responsive platforms.
7. Additionally, examining Nigeria's potential to pioneer linguistic diplomacy could position its multilingual pedagogies as a global model for cultural preservation and collaboration.
8. These research avenues, rooted in Nigeria's socio-linguistic realities, promise to redefine global educational paradigms, and support a scholarship where linguistic pluralism drives innovation and equity.

Conclusion

The quest to harmonize English language education with Nigeria's multilingual heritage unveils a vision for pedagogy, policy, and societal progress. This study illuminates a path where linguistic diversity, far from a hindrance, emerges as a catalyst for educational innovation. With the integration of translanguaging, culturally responsive pedagogy, technology, and teacher training, it charts a course for classrooms that honor indigenous languages while reinforcing global competencies. Bamgbose's (1991) advocacy for multilingualism as a resource finds vindication here, as Nigeria's linguistic tapestry becomes a foundation for equitable learning - it resonates with Obanya's (2004) vision of education as empowerment. The analysis, grounded in Nigeria's socio-linguistic realities, extends global discourses and positions the nation as a beacon for multilingual education scholarship. This endeavor transcends academic inquiry, it offers a blueprint for policy reform that is aligned with Nigeria's National Policy on Education (2013) and Vision 2030. It challenges educators and policymakers to reimagine classrooms as ecosystems where linguistic heritage drives intellectual and economic advancement. The potential for Nigeria to lead global conversations on linguistic diversity, as envisioned by Adegbite (2008), underscores the urgency of sustained investment in teacher training and technology, as UNESCO (2003) mandates. Rather than a mere endpoint, this study invites scholars and practitioners to view Nigeria's classrooms as a testing ground for possibilities, where the harmony of diverse languages shapes a future of equity, innovation, and global connection. In this paradigm, Nigeria's linguistic richness transforms from a heritage to safeguard into a fundamental force driving humanity forward.

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Assessment of Universal Basic Education Reforms among Public Primary Schools in Oyo East Local Government Area of Oyo State, Nigeria

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Abstract

Primary education reforms remain central to improving educational quality and learning outcomes in Nigeria, yet evidence on their implementation at the local government level is limited. This study assessed the implementation of primary education reforms in public primary schools in Oyo East Local Government Area, Oyo State, Nigeria, with particular focus on the level of implementation, teacher capacity, adequacy of instructional resources, and teachers' perceptions of reform impact on teaching and learning outcomes. A quantitative survey research design was adopted. The population comprised public primary school teachers in Oyo East Local Government Area, from which a sample of 150 teachers was selected using appropriate sampling techniques. Data were collected using a structured questionnaire and analyzed using descriptive statistics, including frequencies, percentages, mean scores, standard deviations, and correlation analysis. The findings revealed that the implementation of primary education reforms was generally moderate across schools. Teacher capacity was found to have a significant influence on reform implementation, indicating that teachers' training and professional preparedness play a critical role in translating reform policies into classroom practice. The study also established that instructional resources were largely inadequate, posing a major challenge to effective reform implementation. Furthermore, teachers perceived the impact of primary education reforms on teaching and learning outcomes as moderately positive, suggesting that while reforms have begun to yield benefits, their full potential has not yet been realized. The study concludes that sustained improvement in primary education reform outcomes requires coordinated efforts focused on teacher professional development, adequate resource provision, and strengthened institutional support mechanisms. The findings provide empirical evidence to inform policymakers and education stakeholders on strategies for enhancing primary education reform implementation at the grassroots level.

Keywords: *Primary education reforms; Teacher capacity; Reform implementation; Oyo East Local Government Area*

Introduction

Primary education serves as the cornerstone of national development, providing foundational literacy, numeracy, and life skills necessary for further learning and socio-economic participation. In Nigeria, major reforms—centered on the Universal Basic Education (UBE) programme—have sought to expand access, improve quality, and ensure that primary schools deliver meaningful learning outcomes (Universal Basic Education Commission, n.d.; UNICEF Nigeria, 2025). Despite these policy efforts, questions persist about how effectively reforms are implemented at the grassroots level, particularly in local government areas where contextual constraints vary widely. For instance, national assessments reveal that many primary school learners still struggle with foundational competencies, even as policy frameworks evolve (UNICEF Nigeria, 2025). These outcomes suggest that implementation gaps, rather than policy incompleteness, may be inhibiting reform impact. A growing body of literature highlights that *teacher capacity* plays a crucial role in translating policy into practice, with professional development and preparedness influencing how reforms are enacted in classrooms (UNICEF Nigeria, 2025; Atah & Bessong, 2025). Similarly, the adequacy of *instructional resources*—such as textbooks, teaching aids, and conducive learning environments—remains an ongoing challenge across many Nigerian primary schools and can undermine effective enactment of reform mandates (Ajayi & Sikiru, 2025; UBEC, 2024). Recent national initiatives under the Renewed Hope Agenda have sought to address these issues through large-scale teacher development programmes and school improvement funding, yet localized evidence on how these translate into implementation outcomes is limited (Universal Basic Education Commission, 2023/2024). At the level of teaching and learning outcomes, stakeholders' perceptions of reform effects provide valuable insight into whether policy changes are improving classroom practice and pupil achievement. Evidence suggests that reforms may improve certain school inputs but not necessarily lead to consistent advances in learning outcomes without adequate support systems (UNICEF Nigeria, 2025; Atah & Bessong, 2025). In Oyo East Local Government Area, this context poses important questions about the *extent of reform implementation*, the *role of teacher capacity*, the *availability of instructional resources*, and how *teachers themselves*

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perceive the impact of reforms on educational quality. By aligning inquiry with these dimensions, this study aims to offer evidence that can enhance understanding of reform dynamics and inform policy actions to strengthen primary education delivery in the area.

Statement of the Problem

Despite numerous reform initiatives aimed at improving primary education in Nigeria, significant challenges persist in ensuring that children acquire foundational skills and benefit fully from the educational system. In Oyo East Local Government Area, questions remain about the effectiveness of these reforms, particularly regarding teacher preparedness, availability of instructional resources, and the actual impact on teaching and learning outcomes. Many schools continue to face constraints that hinder the translation of policy into practice, leaving gaps between reform intentions and classroom realities. This situation raises concerns about whether the objectives of primary education reforms are being achieved and highlights the need for an empirical assessment to identify successes, shortcomings, and areas for improvement within the local context.

Research Objectives

The study is guided by the following objectives:

1) To examine the extent of implementation of primary education reforms in public primary schools in Oyo East Local Government Area.
2) To determine the influence of teacher capacity on the implementation of primary education reforms.
3) To assess the adequacy of instructional resources for the effective implementation of primary education reforms.
4) To examine teachers' perceptions of the impact of primary education reforms on teaching and learning outcomes.

Research Questions

The study seeks to answer the following questions:

1) What is the level of implementation of primary education reforms in public primary schools in Oyo East Local Government Area?
2) To what extent does teacher capacity influence the implementation of primary education reforms?
3) How adequate are instructional resources for the implementation of primary education reforms in public primary schools?
4) What are teachers' perceptions of the impact of primary education reforms on teaching and learning outcomes?

Literature Review

Primary Education

Primary education refers to the first stage of formal schooling designed to equip children with foundational knowledge, skills, values, and attitudes necessary for lifelong learning and effective participation in society. In Nigeria, primary education spans six years and targets children aged six to eleven, forming a central component of the Universal Basic Education (UBE) programme (Federal Republic of Nigeria [FRN], 2004). At this level, emphasis is placed on literacy, numeracy, basic science, social studies, and moral instruction, which are critical for children's cognitive, emotional, and social development. International evidence indicates that quality primary education is strongly associated with improved educational trajectories and socio-economic outcomes, particularly in developing countries (UNESCO, 2023; UNICEF Nigeria, 2024).

Educational Reforms

Educational reforms are deliberate and systematic efforts introduced to improve the effectiveness, equity, and relevance of education systems. These reforms often involve curriculum restructuring, changes in instructional methods, teacher professional development, governance adjustments, and accountability mechanisms (Fullan, 2007). In the Nigerian primary education context, reforms have been driven largely by the need to expand access and enhance quality through initiatives such as curriculum reviews and capacity-building programmes for teachers. However, empirical studies indicate that the success of such reforms depends heavily on implementation fidelity, stakeholder engagement, and sustained institutional support, rather than policy formulation alone (Fullan, 2007; UNICEF Nigeria, 2024).

Universal Basic Education (UBE)

Universal Basic Education (UBE) is a national education reform initiative introduced in 1999 and given legal backing by the Universal Basic Education Act of 2004, with the objective of providing free, compulsory, and quality basic education

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for all Nigerian children. The programme encompasses early childhood care, primary education, and junior secondary education, aiming to reduce illiteracy, inequality, and school dropout rates (FRN, 2004; Universal Basic Education Commission [UBEC], n.d.). Although UBE has recorded achievements in increased enrolment and policy coordination, recent evidence reveals persistent challenges such as inadequate funding, teacher shortages, poor infrastructure, and low foundational learning outcomes in literacy and numeracy (UNESCO, 2023; UNICEF Nigeria, 2025). These challenges underscore the need for continuous evaluation and strengthening of UBE implementation strategies.

Primary Education Reforms in Nigeria

Primary education reforms in Nigeria have been largely driven by the need to improve access, equity, and quality in basic education. The introduction of the Universal Basic Education (UBE) programme marked a significant policy shift aimed at addressing chronic issues such as illiteracy, school dropout, and unequal access to education (Federal Republic of Nigeria [FRN], 2004). Several studies indicate that reforms have contributed to increased enrolment at the primary school level, particularly in the early years of UBE implementation (UNESCO, 2023). However, increased access has not consistently translated into improved learning outcomes, as many pupils complete primary education without acquiring foundational literacy and numeracy skills (UNICEF Nigeria, 2024). Empirical evidence suggests that reform implementation varies widely across states and local government areas due to differences in administrative capacity, funding, and school management practices (Bala et al., 2024). Scholars argue that while national policies provide a uniform framework, local contexts significantly shape how reforms are enacted and experienced in schools (Fullan, 2007). Consequently, assessing reforms at the local government level, such as Oyo East Local Government Area, is essential for understanding the practical realities of policy implementation and identifying context-specific challenges.

Teacher Capacity and Professional Development in Reform Implementation

Teachers play a central role in the success of primary education reforms, as they are responsible for translating policy directives into classroom practice. Research consistently shows that teacher quality is one of the most significant determinants of student learning outcomes at the primary level (UNESCO, 2023). In Nigeria, reform initiatives have emphasized teacher training, curriculum familiarity, and pedagogical improvement; however, the effectiveness of these initiatives has been uneven (Bala et al., 2024). Studies indicate that many primary school teachers receive limited or irregular professional development, which undermines their ability to implement revised curricula and learner-centered instructional strategies effectively (UNICEF Nigeria, 2024). Fullan (2007) argues that sustainable educational change requires continuous professional learning rather than one-off training workshops. Without adequate teacher support, reforms risk becoming symbolic rather than transformative. This highlights the importance of examining teacher capacity as a key variable in assessing the effectiveness of primary education reforms.

Instructional Resources and Learning Environment

The availability and quality of instructional resources significantly influence the implementation and outcomes of primary education reforms. Adequate textbooks, teaching aids, classroom facilities, and learning materials are essential for effective teaching and learning, particularly at the foundational level (UNESCO, 2023). In Nigeria, resource provision remains a persistent challenge, especially in public primary schools located in semi-urban and rural areas (UNICEF Nigeria, 2024). Empirical studies reveal that many schools operate with insufficient instructional materials, overcrowded classrooms, and poor infrastructure, which limit the potential impact of curriculum reforms (Bala et al., 2024). These constraints affect teachers' instructional practices and pupils' engagement with learning activities. The literature suggests that reforms focused solely on policy and curriculum changes, without corresponding investment in learning resources, are unlikely to yield significant improvements in educational outcomes (Fullan, 2007). Therefore, instructional resources constitute a critical dimension in evaluating primary education reforms.

Perceived Impact of Reforms on Teaching and Learning Outcomes

Assessing stakeholders' perceptions provides valuable insight into the effectiveness of education reforms, particularly in contexts where standardized learning data may be limited. Research indicates that teachers' and headteachers' perceptions of reform initiatives are often shaped by the extent of support, resources, and training they receive (UNICEF Nigeria, 2024). Positive perceptions are generally associated with higher levels of reform implementation and instructional improvement. However, several studies report a disconnect between reform intentions and perceived learning outcomes in Nigerian primary schools. While stakeholders may acknowledge improvements in policy clarity or school administration,

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they often report limited progress in pupils' academic achievement and skill acquisition (UNESCO, 2023). This perception gap underscores the need for empirical assessments that link reform implementation levels with observed or perceived learning outcomes. Understanding these dynamics is crucial for refining reform strategies and ensuring that policy changes result in meaningful improvements in teaching and learning.

Theoretical Framework

This study is anchored on Fullan's Theory of Educational Change (Fullan, 2007), which emphasizes that successful educational reforms depend not only on policy design but also on effective implementation, teacher engagement, and supportive organizational structures. Fullan posits that for reforms to produce meaningful improvements in teaching and learning, change must occur simultaneously at multiple levels: the policy level, the school level, and the individual teacher level. The theory highlights the importance of teacher capacity, professional development, and the provision of adequate resources as critical factors that influence the translation of reforms into classroom practice. In the context of primary education reforms in Oyo East Local Government Area, Fullan's theory provides a conceptual lens to examine how reforms such as the Universal Basic Education programme are implemented at the school level. It helps explain why gaps may exist between policy intentions and actual outcomes, particularly in areas such as teacher preparedness, instructional resource availability, and perceived impact on learning. By applying this theory, the study can systematically assess the factors that facilitate or hinder the effective implementation of primary education reforms, offering insights for strengthening policy execution and improving teaching and learning outcomes.

Methodology

The study adopted a quantitative survey research design to assess primary education reforms in Oyo East Local Government Area. This design was appropriate because it allowed the collection of structured data from a large sample of respondents, providing measurable insights into teacher capacity, availability of instructional resources, and perceptions of reform impact, while also aligning with Fullan's Theory of Educational Change by examining how teachers and headteachers interacted with reforms and organizational conditions to influence implementation outcomes. The population of the study comprised all primary school teachers and headteachers in public primary schools within the local government area, as they were directly involved in implementing Universal Basic Education (UBE) reforms and could provide relevant data on the effectiveness of these initiatives. Using a stratified random sampling technique, a sample of 150 teachers was selected from different schools to ensure representation across school size, location, and teaching experience. Data were collected using a structured questionnaire developed by the researcher, divided into four sections corresponding to the study objectives: implementation of reforms, teacher capacity, availability of instructional resources, and perceived impact on teaching and learning outcomes. Respondents rated items on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), enabling quantitative analysis of perceptions and experiences. The questionnaire was reviewed by experts in early childhood and primary education to ensure content validity, and a pilot study was conducted to assess reliability, yielding high internal consistency. Questionnaires were administered in person with clear instructions and assurances of confidentiality and voluntary participation, and completed questionnaires were collected promptly to ensure a high response rate. Data were analyzed using descriptive statistics, including frequencies, percentages, means, and standard deviations, to summarize findings, and inferential statistics, specifically Pearson's correlation coefficient, to examine relationships between teacher capacity, resource availability, and perceived reform impact. All analyses were performed using SPSS, and results were interpreted in relation to the study objectives and Fullan's Theory of Educational Change.

Empirical Review

Regarding the level of implementation of primary education reforms, Onoyima and Aka (2024) investigated teachers' perceptions of UBE policy implementation in Enugu State using a descriptive survey. Their findings indicated that while the policy was broadly implemented, actual classroom practices varied significantly due to contextual factors such as school location and funding adequacy. This study highlights that national reforms often encounter gaps between policy intent and practical execution, suggesting the importance of assessing local implementation levels in Oyo East Local Government Area to determine whether similar challenges exist in this context. In terms of teacher capacity and its influence on reform implementation, Atah and Bessong (2025) examined primary school teachers' perceptions of the revised Basic Education Curriculum. Their survey revealed that teachers' professional competence and training strongly influenced their ability to

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implement reforms effectively. Inadequate professional development limited the extent to which teachers could apply curriculum innovations in classrooms, demonstrating that teacher capacity is a critical determinant of reform success. This finding underscores the need to evaluate how teacher preparedness in Oyo East LGA affects the translation of policy into practice. With regard to the adequacy of instructional resources, Ajayi and Sikiru (2021) conducted an evaluation of UBE implementation in Lagos East Senatorial District. They found that although some basic resources were available, gaps in teaching materials and infrastructure significantly hindered reform execution. Their study illustrates the persistent resource constraints in Nigerian primary schools, emphasizing that the availability of instructional resources is central to assessing reform outcomes. Examining resource adequacy in Oyo East LGA can therefore provide insights into the practical challenges schools face in implementing education reforms. Finally, in exploring teachers' perceptions of the impact of reforms on teaching and learning outcomes, Duguryil, Katniyon, and Yoksina (2025) surveyed primary and early childhood care education teachers in Plateau State. Their findings suggested that teachers' perceptions of reforms were shaped by both their teaching capacity and the level of institutional support, with many reporting that resource shortages and weak monitoring systems limited the effectiveness of reform measures. This demonstrates that understanding teachers' perspectives is crucial for evaluating the impact of reforms on educational outcomes and validates the importance of including teachers' perceptions in studies of primary education reform in Oyo East LGA.

Presentation of Results

Table 1: Level of Implementation of Primary Education Reforms

Level of Implementation	Frequency (f)	Percentage (%)	Mean	SD
Poorly Implemented	26	17		
Moderately Implemented	87	58	3.42	0.78
Well Implemented	37	25		
Total	150	100	3.42	0.78

Interpretation: Out of 150 teachers surveyed, 87 teachers (58%) reported that primary education reforms were *moderately implemented*, 37 teachers (25%) perceived them as *well implemented*, while 26 teachers (17%) considered implementation to be *poor*. The mean score of 3.42 indicates a moderate overall level of reform implementation across schools in Oyo East LGA.

Table 2: Teacher Capacity and Its Influence on Reform Implementation

Teacher Capacity Indicators	Frequency (f)	Percentage (%)	Mean	SD
Low Capacity / Inadequate Training	57	38		
Moderate Capacity / Some Training	58	39		
High Capacity / Well-Trained	35	23	3.65	0.71
Total	150	100	3.65	0.71

Pearson Correlation: $r = 0.57$, $p < 0.01$

Interpretation: Among the respondents, 35 teachers (23%) were highly trained and felt confident implementing reforms, 58 teachers (39%) had moderate capacity, while 57 teachers (38%) reported low capacity due to inadequate training. The positive correlation ($r = 0.57$, $p < 0.01$) indicates that higher teacher capacity is associated with more effective implementation of reforms.

Table 3: Adequacy of Instructional Resources

Resource Adequacy	Frequency (f)	Percentage (%)	Mean	SD
Inadequate Resources	89	59		
Moderately Adequate	46	31		
Fully Adequate	15	10	2.94	0.82
Total	150	100	2.94	0.82

Interpretation: Findings revealed that 89 teachers (59%) reported *inadequate instructional resources*, 46 teachers (31%) indicated resources were *moderately adequate*, and only 15 teachers (10%) confirmed that resources were *fully adequate*. The mean score of 2.94 demonstrates that instructional resources are generally insufficient to support effective reform implementation in most schools.

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Table 4: Teachers' Perceptions of the Impact of Reforms on Teaching and Learning Outcomes

Perception of Impact	Frequency (f)	Percentage (%)	Mean	SD
Minimal Impact	44	29		
Moderate Impact	81	54		
Substantial Impact	25	17	3.31	0.77
Total	150	100	3.31	0.77

Interpretation: Regarding the perceived impact of reforms, 81 teachers (54%) indicated that reforms had a *moderate positive impact*, 25 teachers (17%) observed a *substantial impact*, while 44 teachers (29%) reported *minimal impact*. The mean score of 3.31 suggests that, overall, teachers recognize some positive effects of reforms on teaching and learning, though challenges such as limited resources and teacher capacity hinder maximum impact.

Discussions of Findings

The findings of this study show that while primary education reforms in Oyo East Local Government Area are recognized at the school level, their implementation remains inconsistent, reflecting broader national patterns where reform intentions often outpace practical execution; for instance, evaluations of Universal Basic Education (UBE) in other Nigerian contexts have reported that key inputs such as trained teachers and instructional materials are frequently inadequate, hindering meaningful reform outcomes (Researchwap, 2025). Similarly, studies of curriculum reforms elsewhere in Nigeria indicate that teachers generally view reforms as conceptually beneficial but encounter systemic constraints—especially limited training and insufficient instructional resources—that reduce their capacity to deliver intended changes (Atah & Bessong, 2025). This aligns with the present study's finding that a substantial number of teachers reported moderate levels of capacity and insufficient resources, suggesting that gaps in professional development and material support continue to limit effective reform enactment. Additionally, research on teacher effectiveness and monitoring in primary education has identified chronic challenges in supervision and support, with constrained monitoring systems correlating with lower instructional quality and mixed perceptions of reform impact (Duguryil et al., 2025; Osiesi et al., 2024). Together, these studies underscore that although reforms are underway and partially beneficial, the continued prevalence of resource and capacity constraints significantly shapes teachers' perceptions of reform impact on teaching and learning outcomes, highlighting the need for strengthened support structures and targeted resource investment at the school level.

Conclusion

In conclusion, the study established that the implementation of primary education reforms in public primary schools in Oyo East Local Government Area is generally moderate, reflecting partial success in translating policy intentions into classroom practice. Although teachers acknowledged that the reforms have contributed positively to teaching and learning processes, their effectiveness is constrained by limited teacher capacity, inadequate instructional resources, and uneven institutional support, challenges that mirror broader national experiences in primary education reform implementation in Nigeria (Atah & Bessong, 2025; Duguryil et al., 2025; UNICEF Nigeria, 2025). The findings affirm that sustainable improvement in primary education requires more than policy formulation, as effective implementation depends on continuous teacher professional development, adequate resource provision, and supportive school systems, consistent with established perspectives on educational change (Fullan, 2016).

Recommendations

Based on the findings of this study, the following recommendations are made:

1) Regular and well-structured in-service training, workshops, and professional development programmes should be organized to equip primary school teachers with the skills and knowledge required to effectively implement ongoing education reforms.
2) Government and relevant education stakeholders should ensure the adequate and equitable supply of instructional materials, teaching aids, and learning resources to public primary schools to support effective teaching and learning.
3) School supervision and quality assurance systems should be strengthened to provide continuous guidance, feedback, and support to teachers during the implementation of primary education reforms.
4) Adequate and timely funding should be allocated to primary education to support reform-related activities, including teacher training, infrastructure improvement, and instructional resource provision.

5) Stronger collaboration among government agencies, school administrators, teachers, parents, and community stakeholders should be encouraged to foster shared ownership, accountability, and sustainability of primary education reforms.

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Qualitative Study on the Impact of Vignettes in Basic Science Education at Upper Basic Level of Education in Nigeria: A Conceptual Perspective

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Abstract

Vignettes are increasingly used in science education as instructional and assessment tools for examining learners' conceptual understanding, reflective thinking, and decision-making abilities. In the context of Basic Science education, a vignette is a short, context-based scenario drawn from learners' everyday experiences and aligned with curriculum concepts such as health, environment, energy, matter, and safety. This paper discusses the concepts of vignettes, their major types-descriptive, problem-based, reflective and decision-oriented-and their application in Basic Science teaching and research. Both offline (paper-based) and online (digital) vignettes are highlighted as flexible approaches suitable for varying classroom contexts. Criteria for constructing good vignettes include clarity of purpose, realism, cultural relevance, alignment with Basic Science learning objectives, appropriate cognitive demand, and the ability to elicit reasoning rather than rote responses. Research evidence indicates that vignettes enhance learner engagement, promote higher-order thinking, uncover misconceptions, and support the application of scientific concepts to real-life situations. However, limitations such as response bias, over-simplification of complex scientific issues, and challenges in scoring and interpretation are also noted. The paper concludes that vignettes are effective learner-centred tools that complement traditional teaching and assessment methods in Basic Science Education. It is therefore suggested that Basic Science teachers and curriculum developers integrate vignette-based strategies into classroom instruction and assessment, while providing adequate training on vignette design and use to maximise their educational value.

Keywords: Vignette, Basic Science Education, Conceptual Understanding, Reflective Thinking, Decision-Making

Introduction

Basic Science education at the junior secondary school level is designed to develop scientific literacy, problem-solving skills, and responsible decision-making among learners. In Nigeria, the Basic Science curriculum emphasizes the understanding of everyday scientific phenomena related to health, environment, energy, matter, and safety. Despite these goals, traditional instructional and assessment methods such as teacher-dominated lectures and recall-based written tests, often limit learners' active participation and fail to adequately assess their conceptual understanding and application of scientific knowledge (NERDC, 2013). This gap has prompted increased interest in alternative, learner-centred approaches, including the use of vignettes in education. Vignettes are short, brief, descriptive, context-based scenarios that depict a situation, event, or set of circumstances and are designed to stimulate thinking, discussion, judgment, or decision-making.

Vignettes are often written in narrative form and can reflect real-world contexts relevant to learners. Vignettes are used both as data collection to elicit responses from the respondents and as instructional materials to prompt problem-solving and reflection in education. From a conceptual perspective, the use of vignettes in Basic Science education is grounded in constructivist learning theory, which posits that learners actively construct knowledge through interaction with their environment and social experiences (Piaget, 1973; Vygotsky, 1978). By situating scientific concepts within familiar contexts such as homes, schools, and local communities, vignettes support meaningful learning and help learners connect abstract scientific ideas to real-life experiences. Compared with traditional methods, vignette-based instruction offers clear advantages. Instructionally, vignettes promote inquiry, discussion, and critical thinking, encouraging learners to analyse situations rather than memorise facts. As assessment tools, vignettes enable teachers to probe learners' reasoning processes, identify misconceptions, and assess higher-order cognitive skills that conventional tests often overlook Barter & Renold, 2000). In Basic Science education, where understanding concepts and applying them to daily life is essential, vignettes provide a flexible and effective approach for both teaching and assessment. Thus, the conceptual approach to vignette use positions vignettes as powerful instructional and assessment tools that complement and extend traditional practices in Basic Science education.

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Criteria for Well-Structured Vignette

A well-structured vignette is not merely a short story or description; it should be purposefully designed to elicit meaningful responses, align with the study's objectives, and maintain validity. Skilling and Stylianides (2020), St-Marie and Jimmerson (2021), and Wester et al. (2024) identify the following criteria for good vignettes in education:

1. The vignette should be clear about what it is intended to measure or explore and should directly relate to the research questions or learning objectives.
2. A good vignette should undergo validity by subject matter experts to confirm that the content is relevant and important, ensuring it represents the construct being measured to enhance content relevance and importance before use.
3. A quality vignette should describe situations that participants can recognise and relate to in real life. This simulates real decision-making and enhances the authenticity of responses.
4. The language used should be neutral and unbiased, avoiding leading phrases that push the respondent towards a particular answer.
5. A good vignette provides enough detail to make decisions yet avoids unnecessary complexity that overwhelms respondents. There should be sufficient clues for interpretation.
6. Vignettes should be grounded in relevant educational theories or constructs to enhance interpretive rigour. This ensures that responses can be meaningfully interpreted within a scholarly framework.
7. Vignette should be designed to capture variations in real situations, e.g. cultural contexts. This supports generalisation and reduces bias.
8. Vignette should have an appropriate length and focus on the key issue, avoid irrelevant narrative details and keep respondents engaged without overloading the content.
9. Before final use of the designed vignettes, the vignettes should be piloted with a small sample to check for clarity, comprehension, and consistency of interpretation. Pilot testing helps identify ambiguous phrases, misinterpretations, and unexpected emotional reactions.
10. Good vignettes should specify how and when the vignette is presented, e.g. in an interview, survey or online, and ensure participants are oriented to the task before responding.

Every effective vignette should have four parts: the context, the problem/dilemma, the trigger question, and concepts linked to the subject.

Types of Vignettes

In education, there are different types of vignettes depending on their intended use. Instructional vignettes are used as learning tools to stimulate reflective thinking, bridging theory and practice, enhance students' application of knowledge, encourage ethical reasoning and explore cultural interpretations. Assessment vignettes evaluate contexts that include performance assessment, scenario-based testing and simulated decision-making tasks, while cross-cultural/comparative vignettes examine how cultural or contextual differences shape interpretation and decision-making. There are two approaches for disseminating vignettes in the classroom: offline (paper-based) and online (digital). The offline, traditional, or face-to-face vignettes are paper/text scenarios or in-class discussions, and the narrative vignettes are used in interviews or reflective exercises. The benefits of the off-line vignette include rich in-person discussion, promotes immediate teacher-learner interaction, and provides grounding in context. However, the online, digital, or multimedia content typically includes video or digital modules and web-based surveys with hypothetical scenarios. The benefits include support for large-scale quantitative analysis, increased realism and contextual understanding and flexible timing and pacing for respondents. The challenges of online vignettes include limited access to technology and internet connectivity, reduced immediate social interaction, and diminished real-time discussion dynamics.

Literature Review

Theoretical, conceptual, and empirical frameworks for the use of vignettes in education are reviewed. The theoretical framework explains why vignettes work as teaching, assessment and research tools. Vignette use is grounded in several well-established learning theories, including situated learning, constructivist learning, and experiential learning. Brown, Collins, and Duguid (1989) emphasise that learning is most effective when knowledge is presented in real-life contexts rather than as abstract facts. Vignettes are presented to learners in contextualised scenarios that enable them to construct meaning within familiar situations. The educational implications of this theory indicate that vignettes help learners apply

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basic learning concepts to daily life and bridge the gap between theory and practice. The constructivist learning theories of Piaget (1972) and Vygotsky (1978) emphasise that learners are active constructors of knowledge, drawing on prior experiences and social interaction. Presenting vignettes as an instructional aid activates learners' prior knowledge and discussing them promotes social interaction and meaningful knowledge acquisition and application. The educational implications of vignettes based on constructivist theory indicate that they support conceptual change, correct misconceptions, and promote active learning. Furthermore, Kolb's (1984) experiential learning theory posits that learning occurs through experience, reflection, and application. Vignettes stimulate real-life experiences without exposing learners to risk. The educational implications of this learning theory indicate that learners reflect on situations, apply the concepts learned in real-world contexts, and make informed personal decisions. In addition, vignettes move learners beyond remembering to analysing, evaluating and synthesising in Bloom's objective taxonomy of cognitive domain. Vignettes are used to situate learning in context, encourage active construction of knowledge and promote experiential and higher-order thinking. The conceptual framework of vignettes in education illustrates the cause-effect relationship between the use of vignette-based approaches and learning outcomes in education. The key variable is the vignette-based approach, characterised by real-life and contextualised scenarios, problem-based situations, and guided reflective questions. These features stimulate learners' thinking and connect classroom learning to everyday experiences. The intervening (mediating) variables determine several processes that influence the vignette-based approach, including active learner engagement, critical and analytical thinking, and reflection and discussion. These processes explain how the use of vignettes leads to improved learning outcomes. The moderating variables influence the strength and direction of the relationship between vignette use and learning outcomes. These include learners' prior knowledge and teacher facilitation skills. The learning environment and resources, and the time allocated for instruction, are independent variables, whereas the dependent variables represent measurable learning outcomes, such as academic achievement, conceptual understanding, critical thinking, problem-solving, environmental awareness, and decision-making. The relationships among the variables are represented in Figure 1 using vignette-based instruction.

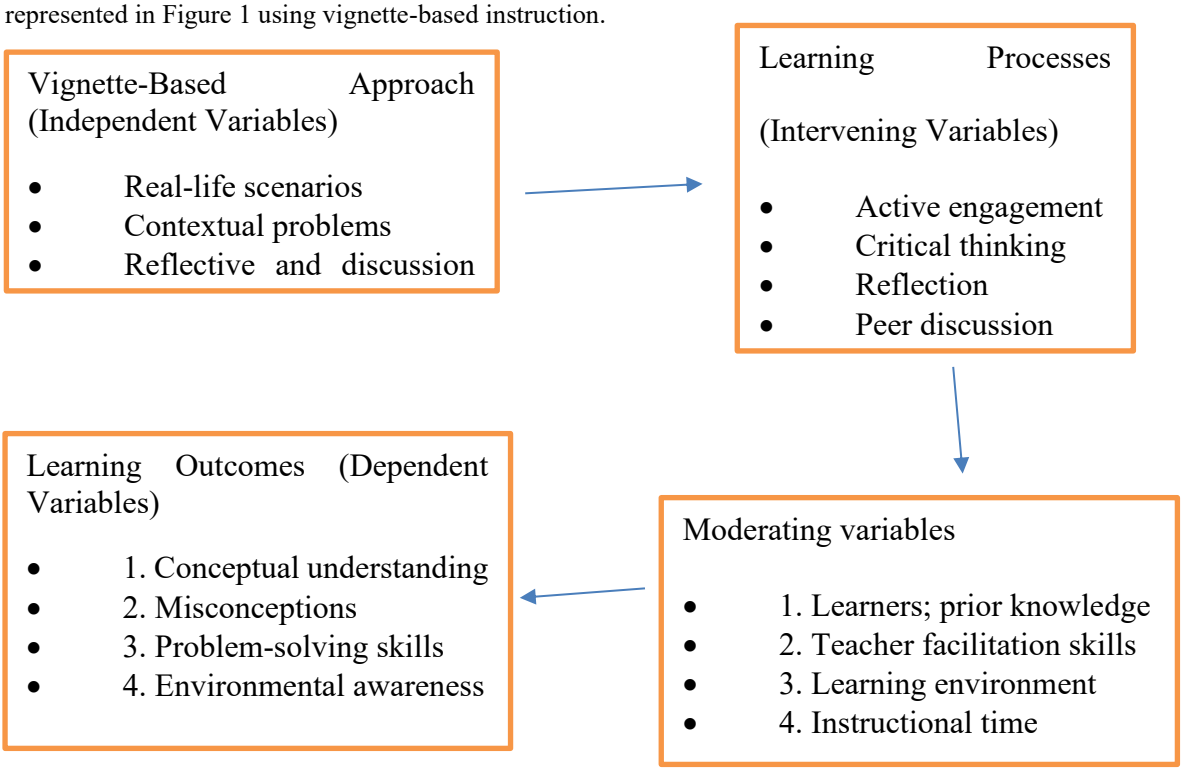

Figure 1: Proposed Conceptual Framework among Variables on the Use of Vignettes in Education

Vignette-based learning tasks expose learners to realistic scenarios, foster active engagement and reflection, and support discussion, reasoning, and improved understanding, skills, and attitudes. The conceptual framework depicts vignettes as

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instructional stimuli that elicit cognitive and affective processes, thereby improving learning outcomes. Empirical evidence indicates that vignettes elicit judgment and reasoning and are superior to direct questioning for exploring learners' knowledge and beliefs (Finch, 1987).

Empirical Review of Vignettes in Education: Benefits and Limitations

Vignettes have increasingly been used as research and instructional tools in education because they can simulate real-life situations while maintaining ethical research practices. One key advantage is that vignettes facilitate discussion on sensitive or ethically charged topics without requiring participants to disclose personal information. This makes vignettes particularly valuable in health and teacher education, where participants can reflect on mental health issues, stigma, or classroom dilemmas in a safe and structured manner (Western et al. 2024; Sheehy et al., 2023). Vignettes also enhance the collection of rich qualitative data by eliciting participants' beliefs, interpretations, and decision-making processes that may not be revealed through surveys or structured questionnaires (Skilling & Stylianides, 2020). In teacher education, video vignettes have been shown to improve prospective teachers' professional vision and diagnostic skills, helping them analyse classroom scenarios more effectively and develop inclusive teaching strategies (Giek et al., 2025). Similarly, vignette designs enable the simultaneous exploration of multiple variables, supporting causal inferences in educational research. For example, online vignette studies have examined the effect of teaching modality and feedback type on learner motivation and engagement (Wirag, 2026). Furthermore, vignettes promote reflective discussion and peer interaction, enabling learners to connect theoretical knowledge with practical situations, thereby increasing task authenticity and cognitive engagement (Giek et al., 2025). They also provide methodological flexibility, being compatible with qualitative, quantitative, and mixed-methods research, and offer research economy by allowing efficient investigation of multiple research questions with limited resources (Skilling & Stylianides, 2020; Wirag, 2026).

Despite these advantages, vignettes are not without limitations. The hypothetical nature of vignette scenarios may reduce external validity, as participants' responses do not always reflect real-world behaviour (Western et al., 2024). Contextual and cultural biases can also arise if vignettes do not adequately represent the diversity of the real-life environments (Sheehy et al., 2023. Simplified scenarios may overlook the complexity of classroom interactions, and participants' interpretations can vary, resulting in ambiguous data (Skilling & Stylianides, 2020). Additionally, designing vignettes that are valid, reliable, and representative requires careful planning, pilot testing, and expert review, which can be resource-intensive (St-Marie & Jimmerson, 2021). Vignettes may also underrepresent the voices of marginalised groups if scenarios are not inclusively designed (Sheehy et al., 2023). In summary, vignettes are powerful tools for enhancing reflective learning, investigating beliefs and decision-making, and promoting engagement in educational research and practice. However, researchers must carefully design and validate vignettes to mitigate issues related to generalisability, cultural bias, and interpretive ambiguity. The benefits and limitations of vignettes suggest that their effective use requires balancing methodological rigour with the construction of realistic scenarios (Skilling & Stylianides, 2020; Western et al., 2024; Wirag, 2026).

Classroom Vignette for Basic Science in the Nigerian Context

This section presented well-constructed classroom vignettes that can be adopted or adapted to elicit learners' conceptual knowledge, reflection and decision-making from respondents. These vignettes are suitable for learners in Junior Secondary School one to three (JSS1-3).

Topic 1: Environmental Pollution (Theme: You and the Environment)

Vignette 1A: Refuse Burning in the Community

During a Basic Science lesson on environmental pollution, the teacher explains that incinerating waste produces air pollution. A student reports that in their community, refuse is burned behind houses and that "people are still healthy." Other students agree, mentioning that there are no waste trucks in their area. The teacher should decide how to respond.

Elicits:

1. Conceptual knowledge: Air pollution and health effects.
2. Reflection: Traditional practices versus scientific explanation
3. Decision-making: Culturally responsive teaching.

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Vignette 1B: Pollution Stream

Students are discussing water pollution using a nearby stream as an example. One student argues that the water cannot be polluted because people still fetch it and fish are observed swimming. The teacher should consider how to explain invisible pollutants and health risks.

Elicits:

1. Conceptual knowledge: Water pollution.
2. Reflection: Visible versus invisible contamination
3. Decision-making: Pedagogical decision

Topic 2: Energy and Energy Sources (Theme: Energy)

Vignette 2A: Generator Use

While teaching about energy sources, the teacher explains renewable and non-renewable energy. A student argues that generators are better than solar energy because electricity supply is unstable in Nigeria. The class begins to debate.

Elicits:

1. Conceptual knowledge: Energy sources
2. Reflection: Practicality versus sustainability
3. Decision-making: Balancing curriculum and reality.

Vignette 2B: Electricity conservation

During a lesson on energy conservation, a student says that leaving appliances plugged in does not waste electricity because the Power Holdings Company of Nigeria (PHCN) light is already on. The teacher notices several students nodding in agreement.

Elicits:

1. Conceptual knowledge: Energy wastage
2. Reflection: Everyday misconception
3. Decision-making: Instructional decision-making.

Topic 3: Matter and Its States (Theme: Matter)

Vignette 3A: Melting of Ice Block

In class, the teacher shows students a block of ice melting in a bowl. A student says the ice has "disappeared" because it is no longer solid. The teacher reflects on how to explain conservation of matter.

Elicits:

1. Conceptual knowledge: Change of state
2. Reflection: Physical change
3. Decision-making: Teaching decision-making.

Vignette 3B: Air has no Mass

While discussing matter, a student insists that air has mass because it cannot be seen. The teacher has limited time and must decide whether to conduct a simple demonstration or continue the lesson.

Elicits:

1. Conceptual knowledge: Properties of gases
2. Reflection: Abstract scientific ideas
3. Decision-making: Classroom decision-making.

The teacher should conduct an experiment to show the concept.

Topic 4: Living and Non-Living Things (Living and Non-Living Things)

Vignette 4A: Virus Classification

During a lesson on characteristics of living things, a student asks whether viruses are living or non-living. The class gives mixed answers and the teacher notices confusion.

Elicits:

1. Conceptual knowledge: Characteristics of life.
2. Reflection: Scientific uncertainty
3. Decision-making: Handling complex concepts.

Vignette 4B: Movement in Plants

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A student says plants are non-living because they do not move from one place to another. The teacher must determine how to explain plant movement using examples familiar to Nigerian students.

Elicits:

1. Conceptual knowledge: Plant movement.
2. Reflection: Observable versus internal processes
3. Decision-making: Teaching strategy decision

Topic 5: Safety and Health Education (Theme: Safety and Health)

Vignette 5A: Laboratory Safety

Before a Basic Science practical, some students refuse to wear googles, saying they have never seen anyone injured before during practical activities. The teacher is under pressure to complete the practical within the period.

Elicits:

1. Conceptual knowledge: Laboratory safety rules
2. Reflection: Risk awareness.
3. Decision-making: Safety versus time management.

Vignette 5B: Hand Washing and Hygiene

During a lesson on personal hygiene, a student claims handwashing is unnecessary if hands look clean. Other students support the idea, citing home practices.

Elicits:

1. Conceptual knowledge: Disease prevention.
2. Reflection: Appearance versus hygiene.
3. Decision-making: Pedagogical decision-making.

The Standard Response Prompts

The respondents should answer the following question to align with the constructed vignettes.

1. What Basic Science concept is involved in this situation?
2. Identify any misconception shown.
3. How would you respond to the situation?
4. Give reasons for your decision.

Conclusion

Vignettes have proven to be a valuable pedagogical and research tool in education, particularly for eliciting learners' conceptual understanding, reflective thinking, and decision-making skills. By presenting realistic, context-based scenarios, vignettes bridge the gap between abstract concepts and real-life experiences, enabling learners to engage meaningfully with subject matter. In Basic Science education, especially within Nigeria context, vignettes align well with curriculum goals by addressing common misconceptions, promoting scientific reasoning and encouraging learner-centred instruction. Vignettes flexibility allows for use across cognitive, affective and behavioural domains, making them suitable for assessment, classroom instruction and educational research.

Recommendation

Based on the theoretical, conceptual and empirical insights of this article, the following recommendations are made:

1. Instructional practice: Basic Science teachers should adopt vignette-based strategies to support learners-centred instruction, particularly for teaching abstract concepts and addressing common misconceptions.
2. Curriculum implementation: curriculum planners and educators should incorporate vignettes into classroom activities and continuous assessment practices to promote higher-order thinking and real-life application of scientific knowledge.
3. Teacher education programmes: Colleges and faculties of Education should include vignette design and use as part of science teacher training, focusing on reflective questioning and decision-making tasks.
4. Assessment and evaluation: Vignettes should be used as alternative assessment tools to evaluate not only factual knowledge but also learners' reasoning, judgement and problem-solving.
5. Blended learning approaches: Both offline (paper-based) and online (digital) vignettes should be employed to accommodate variations in school resources and learners' access to technology
6. Future studies should examine the empirical findings on the effects of vignette-based instruction on learners' academic achievement, retention, and transfers of learning across different science subjects.

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Integrating Innovative Technologies for Information Service Delivery among Military Tertiary Institution Librarians in Kaduna State, Nigeria

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Abstract

This study focused on Adoption of Innovative Technologies for Information Service Delivery by Library Staff in Military Tertiary Institution Libraries in Kaduna State, Nigeria. It is set to achieve 2 objectives among which are to find out types of innovative technologies military tertiary institution will adopt ,to find out the types of information service that can be rendered with innovative technologies ,Quantitative research methodology and a cross-sectional Survey research design were adopted. The study covers the staff of 3 Military Higher Institutions Libraries with a total of 102 professionals and paraprofessional staff. Using Census sampling technique data was collected through questionnaires. One hundred 102 copies of the questionnaire were distributed to the respondents. The study found out that; Blockchain Technology, AI, VR, AR, and IoT are the potential tools for improving information service delivery, in Military Tertiary Institution Libraries in Kaduna State, Nigeria, it also found out that Cloud-Based Library Services and Database Management are potential services for efficient information service delivery, The study concluded the adoption of innovative technologies for information service delivery by library staff in military tertiary institution libraries is crucial for modernizing library operations and aligning with the rapidly evolving digital landscape. The study recommended that the Librarians of Military Tertiary Institution Libraries in Kaduna State, Nigeria in collaboration with the commandant should prioritize the adoption of blockchain technology. Also study recommended that this technology will provide a secure and transparent method for managing library operations, protecting sensitive user information, and ensuring the integrity of data related to resource management and also recommended that the Librarians of Military Tertiary Institution Libraries in Kaduna State, Nigeria with the help of the commandant should address the significant challenges associated with the adoption of innovative technologies for effective information service delivery

Keywords: Adoption, Innovative Technology, Information Service Delivery, Military Tertiary Institution

Introduction

The integration of innovative technologies has transformed information service delivery, changing how information is accessed, managed, and shared. Adoption of these technologies by information professionals is critical for enhancing service efficiency, meeting user needs, and improving overall satisfaction. Adoption represents the initial step toward understanding, evaluating, and embracing innovations, enabling professionals to leverage new tools effectively (OECD, 2018). Innovative technologies encompass advanced solutions that improve task execution, service delivery, and resource management. In libraries, technologies such as library management systems, artificial intelligence (AI), mobile applications, the Internet of Things (IoT), and immersive tools like virtual and augmented reality (VR/AR) facilitate efficient operations, remote access, and engaging learning experiences (Michael & Stephens, 2021; Kumar & Sharma, 2020). Mobile applications and social media further enhance communication and outreach, broadening the reach of library services. By adopting these innovations, libraries can provide inclusive, interactive, and user-centered services, contributing to both academic success and broader social development. This study therefore investigates the adoption of innovative technologies for information service delivery by library staff in military tertiary institution libraries in Kaduna State, Nigeria, and explores their potential positive impact on service provision.

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Statement of the Problem

Innovative technologies play vital role in transforming service delivery within libraries, revolutionizing how information is accessed, stored, and disseminated. AI-driven recommendation systems help patrons discover relevant materials based on their preferences and previous searches, significantly improving the user experience. Virtual assistants provide immediate assistance to users, offering real time support and guidance, thereby enhancing customer service. Similarly, the utilization of innovative technologies like augmented reality (AR) and virtual reality (VR) has the potential to revolutionize learning experiences within libraries. By embracing these innovations, libraries will evolve into dynamic spaces that foster engagement, learning, and collaboration, and catering for the diverse needs of their patrons in the digital age. Studies by Michael & Stephens (2021) emphasized the importance of innovative technologies to create engaging and interactive experiences for library patrons. They highlight the role of librarians as facilitators of technology rich learning environments. Despite the benefits of innovative technologies in libraries, the researchers, observed that Military tertiary institution libraries in Kaduna state are yet to adopt and use innovative technologies for information service delivery which consequently has resulted to many challenges in information service delivery of the libraries .The consequence of not addressing these problem could lead to significant challenges for example, students may face difficulties accessing resources efficiently, which could hinder their academic progress and put them at a disadvantage compared to peers at more technologically advanced institutions. Also, staff members would likely experience increased workloads due to the lack of automation, leading to inefficiencies, potential errors, and reduced job satisfaction. Besides, management might struggle with operational inefficiencies, making it difficult to manage resources effectively, which could damage the library's reputation and limit opportunities for growth and partnerships, and the library could become less effective, negatively impacting all stakeholders involved.

Objectives of the Study

The following research objectives are set to be achieved by the study

1. To find out types of innovative technologies that Staff of Military tertiary Institution Libraries could adopt of for information service delivery.
2. To find out the types of service that could be rendered with innovative technologies for information service delivery by Staff of Military Tertiary Libraries in Kaduna State Nigeria.

Literature Review

Libraries play a critical role in facilitating access to information to support teaching, learning, and research. In the digital age, the adoption of innovative technologies has become essential for enhancing library operations and responding to the evolving needs of users (Bello, 2021; Aina, 2014). Studies indicate that innovative technologies have expanded the scope of library services beyond traditional physical spaces, enabling more flexible, user-centered, and technology-driven service delivery (Chowdhury, 2018). The scope of technology adoption in libraries covers key functional areas such as digitization, digital preservation, institutional repositories, online databases, and automated library systems (Chowdhury, 2018; Issa, Amusan, & Daura, 2018). These technologies improve access to scholarly content, support long-term preservation, and enhance the visibility of institutional research outputs. Empirical studies in Nigeria and other developing contexts report that digital technologies significantly improve access to information resources and promote scholarly communication, although adoption levels vary across institutions (Onuoha, 2019; Adebayo & Oladipo, 2021). Libraries are undergoing significant transformation driven by innovative technologies that extend beyond basic automation to include the redesign of workflows, services, and user engagement strategies (Chowdhury, 2018; Hider & Tan, 2019). Innovative technologies, including artificial intelligence, mobile computing, cloud services, RFID, and the Internet of Things, are increasingly used to enhance circulation, security, personalization, and operational efficiency (Kumar & Sharma, 2020; Michael & Stephens, 2021). These tools enable libraries to position themselves as digital knowledge hubs and learning commons. Information service delivery refers to the processes through which libraries provide timely, relevant, and value-added services to users. The literature consistently shows that innovative technologies enhance service delivery by improving speed, accuracy, accessibility, and user engagement (Rowley, 2011; Kumar & Sharma, 2020). Technology-enabled services such as online reference, mobile access, and automated circulation systems support remote and flexible service provision (Onuoha, 2019; Issa et al., 2018). However, several studies emphasize that effective technology adoption is shaped by organizational and human factors, including staff ICT competence, management support, funding, and institutional policies (Aina, 2014;

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Olatokun & Inegbedion, 2015). In developing countries, these constraints continue to limit the full realization of technology benefits in libraries (Adebayo & Oladipo, 2021). The literature therefore highlights the need for context-specific studies, particularly in specialized settings such as military tertiary institution libraries, where empirical evidence remains limited.

Methodology

Quantitative research methodology was used to conduct this study. Quantitative research methods are used in research studies to collect and analyze numerical data in order to identify patterns or trends. These methods are useful for studying small and large sample sizes, as they allow researchers to make inferences about a population based on a representative sample. Cross sectional survey research design was used for this study. The design was used in this research because it allows for the collection of data from a sample of individuals at a single point in time, The population of the study consists of 102 library staff which are 58 professional librarians and 44 para professional's library staff of the selected military tertiary institution libraries which are; Nigerian Defense Academy library Kaduna, Institute Library, Air force Institute of Technology Kaduna and Ejiga library, Armed Forces Command and Staff College Jaji. In this study 102 librarians were used as sample size this census sampling technique was used for the research.

The instrument used to collect data for this study is a self-developed questionnaire, a split half method of reliability test was used where ten questionnaires were divide into two halves of five, and both parts were given the instrument at the same time. Then, the scores from both part of the test were correlated. The reliability factor is determined using Cronbach's alpha reliability test for the instrument which is considered reliable when the value is 0.5 and above and the reliability coefficient of the instrument for this study was 0.832, A letter of introduction was collected from the Department, introducing the researchers for data collection on Adoption of Innovative Technologies for Information Service Delivery by Staff of Military Tertiary Institution Libraries in Kaduna State. The letter was submitted to each of the Institution librarians. Descriptive statistics was used to analyze the data collected from the research questions. Frequency count and percentage was also used to analyze research questions the benchmark is 50% and above using SPSS version 26.

Response Rate

Out of the 102 copies of the questionnaire were administered to the respondents and a total of 94 (92.2 %) copies were retrieved and duly completed and found usable for analysis. The high response rate is attributed to the fact that the respondents were duly followed up and given up to four weeks within which to complete and return the questionnaire.

Table 1: Response Rate

S/N	Name of Libraries	Copies of questionnaires distributed	Copies of questionnaires returned	Percentage of questionnaires
1	Nigerian Defense Academy Library Kaduna	34	30	29.4%
2	Institute Library, Air force Institute of Technology Kaduna	44	42	41.2%
3	Ejiga Library Armed Forces Command and Staff College Jaji	24	22	21.6%
	Total	**102**	**94**	**92.2%**

Source: Field Survey, 2024

Research objective 1:

Types of Innovative Technologies Military Tertiary Institution Libraries could adopt for Information Service Delivery by Library Staff in Kaduna State, Nigeria.

In order to examine the adoption on types of innovative technologies for information service delivery by library staff of military tertiary institution libraries in Kaduna State, Nigeria, a comprehensive list of possible technologies was presented to the respondents. Respondents were encouraged to select as many technologies which they are aware of and beneficial for enhancing information services. The findings are presented in Table 2.

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S/N	Types of Innovative Technologies	NDA LIBRARY (F %)	AFIT LIBRARY (F %)	EAFCSC LIBRARY (F %)	TOTAL (F %)
1.	(Radio Frequency Identification) RFID	20 (32.8%)	25 (41.0%)	16 (26.2%)	61 (66%)
2.	Virtual reality (VR) & Augmented reality (AR)	30 (37.5%)	25 (31.2%)	25 (31.2%)	80 (87%)
3.	Mobile Application Technology	7 (36.8%)	6 (31.6%)	6 (31.6%)	19 (21%)
4.	Artificial intelligence (AI) & Chatbot	25 (36.2%)	22 (31.9%)	22 (31.9%)	69 (75%)
5.	Block chain Technology	30 (34.9%)	28 (32.6%)	28 (32.6%)	86 (93%)
6.	Big Data Analytics & User profiling	15 (35.7%)	14 (33.3%)	13 (31.0%)	42 (45%)
7.	Internet of Things and Sensors	28 (34.1%)	27 (32.9%)	27 (32.9%)	82 (89%)
8.	Online Communities & Social media Technology	20 (39.2%	16 (31.4%)	15 (29.4%)	51 (55%)
9.	Gamification & Interactive Learning Platform	24 (35.3%)	22 (32.4%)	22 (32.4%)	68 (73%)
10.	Assistive Technology for Accessibility	16 (35.6%)	15 (33.3%)	14 (31.1%)	45 (48%)
11.	Robotics & Automaton Systems	18 (34.6%)	17 (32.7%)	17 (32.7%)	52 (56%)
12.	Makerspace and 3D Painting	7 (41.2%)	6 (35.3%)	4 (23.5%)	17 (18%)

Source: Field Survey, 2024.

*Key :(**F** %): Frequency and Percentage **NDA**: Nigerian Defence Academy Library, **AFIT**: Air force Institute of Technology library, **EAFCSC**: Ejiga Library Armed Forces Command and Staff College Jaji.*

Discussions

Data on innovative technologies for information service delivery in military tertiary institution libraries in Kaduna State reveal clear institutional priorities. Blockchain technology recorded the highest level of awareness, indicating strong consensus on its relevance for secure, transparent, and accountable information management. This reflects the central importance of data protection and information integrity within military academic environments.

Virtual Reality (VR) and Augmented Reality (AR) also demonstrated high awareness, suggesting growing recognition of immersive technologies as tools for enhancing learning, user engagement, and interactive information access. Their consistent acceptance across institutions indicates a shared institutional orientation toward technology-driven educational innovation. In contrast, makerspace and 3D printing technologies recorded the lowest level of awareness, reflecting limited emphasis on hands-on and creative technologies. This suggests that military tertiary institution libraries prioritize innovations with direct relevance to security, instructional delivery, and operational efficiency over those focused on experiential learning and prototyping. These findings align with existing studies that highlight blockchain's role in secure resource management (O'Byrne, 2020) and the capacity of VR/AR to enhance learning and user experience (Radu, 2014; Billinghurst, Clark, & Lee, 2015), while indicating that makerspace-oriented innovations (Moorefield-Lang, 2015) remain underdeveloped in military library contexts.

Research objective 2: Types of Services Rendered with Innovative Technologies for Information Service Delivery by Library Staff of Military Tertiary Institution Libraries in Kaduna State, Nigeria.

To explore the types of services that can be enhanced through using innovative technologies in military tertiary institution libraries in Kaduna State, Nigeria, a detailed analysis was conducted in Table 3.

S/N	Types of Services that could be Rendered with Innovative Technologies	NDA LIBRARY (F %)	AFIT LIBRARY (F %)	EAFCSC LIBRARY (F %)	TOTAL (F %)
1.	Digital Reference Service	30 (34.5%)	29 (33.3%)	28 (32.2%)	87 (94%)
2.	Digital archiving and preservation service	16 (35.6%)	15 (33.3%)	14 (31.1%)	45 (48%)
3.	Database Management Service	30 (34.1%)	29 (33.0%)	29 (33.0%)	88 (95%)
4.	Cloud Base Library Service	30 (33.7%)	30 (33.7%)	29 (32.6%)	89 (96%)
5.	Online Public Access Catalog Service	8 (38.1%)	7 (33.3%)	6 (28.6%)	21 (22%)
6.	E- Learning Support Service	30 (35.3%)	28 (32.9%)	27 (31.8%)	85 (92%)
7.	Data Analysis Service	9 (37.5%)	8 (33.3%)	7 (29.2%)	24 (26%)
8.	Current Awareness Service	28 (39.4%)	24 (33.8%)	19 (26.8%)	71 (77%)
9.	Translation and Interpretation Service	26 (35.1%)	25 (33.8%)	23 (31.1%)	74 (80%)
10.	Consortium Service	25 (36.8%)	24 (35.3%)	19 9(27.9%)	68 (73%)
11.	Checking and Discharging Service	20 (40.8%)	16 (32.7%)	13 (26.5%)	49 (53%)

Source: Field Survey, 2024

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***Key:(F %)**: Frequency and Percentage **NDA**: Nigerian Defence Academy Library, **AFIT**: Air force Institute of Technology library, **EAFCSC**: Ejiga Library Armed Forces Command*

Findings on the types of services enhanced through innovative technologies in military tertiary institution libraries in Kaduna State indicate a strong institutional focus on services that improve accessibility, efficiency, and digital service delivery. Cloud-based library services recorded the highest level of adoption, reflecting widespread institutional commitment to scalable and flexible digital infrastructure. This highlights the strategic importance of cloud technologies in supporting resource sharing, collaboration, and efficient library management within military academic environments.

Digital reference services and database management services also recorded very high levels of adoption, underscoring their central role in supporting timely user support and effective organization and retrieval of information resources. The strong adoption of these services suggests that military tertiary institution libraries prioritize technologies that directly enhance service responsiveness and operational effectiveness. E-learning support services similarly demonstrated high adoption, reflecting the increasing integration of library services into digital learning environments. This aligns with the growing demand for technology-enabled instructional support within higher education and military training contexts. In contrast, services such as Online Public Access Catalog (OPAC) and data analysis services recorded relatively low levels of adoption. This suggests a strategic shift away from traditional or stand-alone systems toward more integrated and advanced digital platforms. The lower emphasis on these services indicates that institutional priorities favor technologies perceived to offer greater immediate operational and instructional value. These findings are consistent with prior studies that emphasize the role of cloud computing in enabling flexible, cost-effective, and scalable library services (Rieke & Jones, 2019; Khan & Bhatti, 2017). Overall, the results demonstrate that military tertiary institution libraries are increasingly adopting innovative technologies to support core service areas, while selectively deprioritizing traditional systems that may be viewed as less aligned with evolving digital service expectations. The strong preference for cloud-based library services highlights the increasing need for flexible, scalable, and collaborative digital infrastructures in military libraries. Given the unique nature of military institutions, where security and accessibility must be carefully balanced, the widespread recognition of cloud solutions points to their potential in enhancing operational efficiency. This aligns with the assertion by Khan & Bhatti (2017) that cloud computing not only improves resource accessibility but also fosters cost efficiency and seamless information management. The study highlights the growing importance of innovative technologies in shaping the future of military tertiary institution libraries. The potential of cloud computing, digital reference services, and database management suggests a clear demand for technologies that enhance accessibility, collaboration, and efficiency. However, the lower emphasis on OPAC services indicates a need for strategic evaluation of traditional systems in favor of more advanced solutions. These insights emphasize the necessity for military libraries to continuously assess and integrate emerging technologies that align with their operational needs and user expectations. By doing so, they can ensure that their services remain relevant, efficient, and responsive to the evolving information landscape.

Conclusion

Adoption of innovative technologies for service delivery by staff of military tertiary institution libraries is essential for modernizing library operations, enhancing security, improving resource accessibility, and fostering collaboration. Technologies such as blockchain, cloud-based platforms, the Internet of Things (IoT), and artificial intelligence (AI) have the potential to revolutionize how library resources are managed, accessed, and utilized. These technologies enhance the security and integrity of data, improve remote accessibility, streamline resource sharing, and offer new opportunities for user engagement through interactive and immersive tools. Military tertiary institution libraries can transform into modern hubs of knowledge that are not only efficient and secure but also responsive to the needs of their users. This transformation will support educational and research activities more effectively, enable real-time access to information, and foster an environment conducive to learning and collaboration. The future of military higher institution libraries lies in their ability to adapt and evolve, ensuring that they continue to serve as vital information resources in an increasingly digital worlds

Recommendations

Based on the finding of the study, the following recommendations are provided

1. In light of the importance of innovative technologies for enhancing information service delivery, it is recommended that the Librarians of Military Tertiary Institution Libraries in Kaduna State, Nigeria in collaboration of the commandants and management based on adoption level of these technologies should include technologies like

blockchain technology. This technology will provide a secure and transparent method for managing library transactions, protecting sensitive user information, and ensuring the integrity of data related to resource management.

2. Considering the potential of innovative technologies to transform information service delivery, it is recommended that the Librarians of Military Tertiary Institution Libraries in Kaduna State, Nigeria and the commandants should focus on implementing a range of technology driven services. Establishing digital reference services will enable users to access expert assistance remotely, while Cloud-based library services should be implemented to facilitate seamless resource access and improve collaboration.

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Assessing the Impact of Artificial Intelligence Tools on Reading Proficiency among Undergraduate Students of Prince Abubakar Audu University Anyigba, Kogi State Nigeria

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Abstract

Reading proficiency is a fundamental skill in higher education, yet many undergraduate students in Nigeria struggle with comprehension due to limited support and outdated instructional methods. The integration of artificial intelligence (AI) tools into education offers new possibilities for personalized and adaptive learning, but little research has examined their specific impact on reading development in Nigerian undergraduate settings. This study explores the perception and experiences of undergraduate students regarding the use of AI tools such as chatgpt, Rewordify and Read theory for enhancing students' academic reading proficiency. Using a qualitative research approach, semi-structured interviews were conducted with eighty students from diverse disciplines who had prior exposure to AI tools. The thematic analysis framework was used to identify key themes across participant responses. Emerging themes included personalized and self-paced learning, vocabulary support and comprehension, increased engagement, and provision academic confidence. However, challenges such as over reliance on AI generated content, inconsistent usage habit, and digital literacy gaps were also identified. Finding suggested that AI tools, implemented with appropriate guidance, equitable access, and curriculum alignment, can significantly enhanced students' reading confidence, comprehension, and motivation. The study contributed to the body of literature on AI in education by offering context-specific insight for technology integration in literacy instruction. It highlighted the need for inclusive, students centered strategy to promote reading proficiency in resource-constrained academic environment. Future research should explore teachers respective, long-term learning outcomes, and the integration of AI tools across diverse linguistic and institutional contexts to further validate and expand on these findings.

Key Words: Artificial Intelligence Tools, Reading Proficiency, Undergraduate, students.

Introduction

In the digital age, artificial intelligence (AI) has emerged as a transformative force in education, reshaping how students learn, engaging with content, and developing essential academic skills (Khan & Rasheed, 2023). AI-based tools, particularly those designed for English language learning, have shown substantial potential in improving reading proficiency by offering personalized, adaptive, and interactive learning experiences (Zawacki-Richter et al, 2020; Dwivedi et al, 2021). Reading proficiency is fundamental to academic success, especially for undergraduate students who are required to comprehend complex texts, analyzing information critically, and applying knowledge across disciplines. However, traditional instructional methods often lack the flexibility and individualization necessary to address students' diverse reading needs, leading to disengagement and uneven progress (Siddiqui & Abbas, 2023). Recent developments in educational AI have introduced a variety of tools- such as ChatGPT, Rewordify, and ReadTheory- that provide real-time feedback, simplifying dense academic texts, and adjusting content on the learner's level. These tools not only assist in vocabulary development and comprehension but also foster learner autonomy and motivation through gamified, interactive, and self-paced learning environments (Khosravi et al., 2022; Noor & Hussain, 2024). Moreover, in disadvantaged educational settings like those in Nigeria, such AI tools offer scalable and low-cost solutions to bridge the gap in reading achievement and instructional quality (Qazi et al., 2023; Aftab & Rehman, 2025).

Despite the growing presence of AI tools in the classrooms, there is limited empirical research works focusing on their impact, specifically on reading proficiency among undergraduate students, supported reading platforms, while others raise concerns regarding digital literacy, student over-reliance, and unequal access to technology (Chen et al., 2021; Vaidya & Kumari, 2022; Baig & Saleem, 2024). This lack of consistent findings underscores the need for more context-specific studies. This study aims to investigate the use and impact of the AI tools enhancing reading proficiency among undergraduate students, with a particular focus on effectiveness, student engagement, and associated challenges. This research focus on undergraduate students from Prince Abubakar Audu University Anyigba who are using AI tools in academic reading contexts. By exploring how practices for integrating such technologies in higher education help to

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improve academic reading outcomes. Despite the increasing use of AI tools in education, many undergraduate students struggle to achieve sufficient reading proficiency, which negatively affects their academic performance and overall comprehension skills. These challenges are primarily caused by traditional, one-size-fits-all instructional approaches that fail to address individual learning needs, offer minimal real-time support, and lack interactivity (Siddiqui & Abbas 2023). As students encounter increasingly complex academic texts, their inability to decode, interpret, and engage meaningfully with written content limits their educational potential. In Nigeria, the issue is further intensified by large class sizes, outdated materials, and limited teacher attention, which prevent personalized instruction and hinder vocabulary development (Qazi et al., 2023). These limitations leave many students disengaged, demotivated, and underprepared for higher-level reading tasks. The situation becomes more problematic in reading large volume of works, where comprehension and critical thinking are crucial for success. Consequently, the lack of effective, student-centered reading instruction remains a persistent barrier in promoting academic literacy at the undergraduate level (Aftab & Rehman, 2025).

Research Question:

This study was guided by the following research questions.

(i) To what extent does the undergraduate students perceive and experience the use of AI tools in improving their academic reading proficiency?

(ii) What challenges and benefits do undergraduate students encounter when using AI-based tools for enhancing reading comprehension?

Literature Review

In recent years, the integration of Artificial Intelligence (AI) into the English Language education landscape system has reshaped traditional learning processes and pedagogical strategies (Zawacki-Richet et al. 2020) Among its may applications, AI has significantly influenced language acquisition and reading proficiency development (Chen et al , 2021). Reading proficiency, which is a foundational academic skill, is vital for undergraduate students to comprehend complex texts, analyze content critically, and perform successfully across disciplines (Dwivedi et al,. 2021). However, despite its importance, many student particularly in developing countries struggle with reading comprehension, vocabulary acquisition, and engagement (Siddiqui &Abbas, 2023). AI tools, such as chatgpt, Rewordify, and Read Theory are emerging as potential solutions to these challenges, offering personalized and interactive learning experiences (Khan & Rasheed, 2023; Noor &Husain, 2024). This literature reviews examines existing research on the impact of AI tools on reading proficiency, focusing on theoretical foundations, key themes, methodologies, knowledge gaps, and recent development in the field. This study is anchored to Vygotsky's (1978) Sociocultural Theory of learning, which emphasizes the critical role of social interaction and cultural tools in cognitive development. Central to this theory is the concept of the Zone of Proximal Development (ZDP) the gap between what a learner can do independently and what they can achieve with guidance and support. AI-based reading tools, such as chatgpt, Rewordify, and Read theory, act as digital scaffolds by providing real-time feedback, simplifying complex texts, and adjusting content difficulty based on learner needs (Khosrav et al,. 2022). These simulate the role of a more knowledgeable other, enabling students to progress through their ZDP with guided assistance. In this way sociocultural theory provides a robust framework for understanding how AI technologies can enhance reading proficiency by supporting interaction, personalization, and mediated learning in academic environments. Several recurring themes emerges from the literature on AI tools and proficiency:

AI applications tailor reading materials to match individual learner levels, ensuring content is neither too easy nor overly challenging (Khosravi et al., 2022). Platform such as read theory provide instant corrective feedback, providing metacognitive skills and self-regulation (Noor& Hussaini, 2024). Tools like Rewordify enhance lexical understanding by simplifying difficult words and offering definitions in context (Baig & Saleem, 2024). Gamified features and adaptive challenges help sustain student interest and motivation (Qazi et al., 2023). AI tools can support students with diverse learning needs, including those from disadvantaged environment (Aftab & Rehman, 2025). A review of empirical studies revealed a variety of research designs used to investigate AI's role in reading proficiency. Most studies employ mixed-method or quasi-experimental approaches to evaluate learning outcomes. For instance, Dwivedi et al. (2021) used pre and post-test comparisons to measure improvements in reading comprehension after the use of AI tools. Others, such as khan and Rasheed (2023), employed surveys and interviews to explore student's perceptions of AI-assisted reading platforms. Baig and Saleem (2024) combined performance analytics with qualitative feedback to analyze learner outcomes. Despite

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these efforts, there is a noticeable lack of longitudinal studies, particularly in non-western contexts. Additionally many studies rely heavily on self-reported data, which may limit objectivity and generalizability. Despite a growing body of work on AI in education, several gaps exist.

The Role of the teacher in the Integration of AI in Reading Comprehension

Most literature focuses on student outcomes, with minimal attention to teachers' roles in the integration AI into reading instruction (Vaidya & Kumari 2022). Recent advancements in AI, particularly generative AI and natural languages processing (NLP), have further expanded the capabilities of educational technologies (Zawacki-Richter et al., 2020). Tools like CHATGPT now provide dynamic conversational support allowing user to ask clarifying questions, summarize texts, and practice reading comprehension interactively (Khan & Rasheed, 2023; Noor & Hussein, 2024). Moreover, adaptive reading systems has become more sophisticated in analyzing student responses and tailoring content accordingly (Baig & Saleem, 2024). In developing countries, mobile-friendly AI platforms are increasingly being used to reach underprivileged learners, thus democratizing access to quality reading support (Quazi et al 2023; Aftab & Rehman, 2025). The existing literature provides promising evidence for the potential of AI tools in enhancing reading proficiency. Personalized feedback, adaptive content, and engaging formats appear to benefit learners across diverse contexts. However, the literature also reflects tendency to overemphasize the capabilities of technology while underestimating the importance of pedagogical integration and human oversight (Vadiya & Kumari, 2022). Several studies lack theoretical grounding, and there is a need for more robust, comparative research that considers cultural, institutional, and infrastructural variables (Chen et al., 2021). Furthermore, ethical considerations, such as data privacy and equitable access, are seldom addressed (Zawacki-Richter et al., 2020). Therefore, while AI tools offer substantial promise, their implementation must be guided by sound educational principles and contextual realities. Tools represent a transformative development in the quest to enhance reading proficiency among the undergraduate students. By offering personalized, interactive, and scalable learning environments, these technologies address many of the shortcomings of traditional reading instruction (Khosravi et al., 2022; Noor & Hussain, 2024). However, the literature also reveals significant limitations in current research, including a lack of contextual focus, insufficient longitudal data, and under representation of teacher perspective (Baig & Saleem, 2024). Future studies should aim to bridge these gaps by adopting comprehensive, theory-informed, and context-specific methodologies. Ultimately, integrating AI tools into reading instruction should not replace human educators but rather empower them to deliver more effective, inclusive, and student-centered learning experiences (Aftab & Rehman, 2025).

Research Methods

This study adopted a qualitative research approach to investigate how undergraduate student of Prince Abubakar Audu University Anyigba, Kogi State, Nigeria can see and experience the use of Artificial Intelligence (AI) tools in enhancing their reading proficiency. A qualitative research design was chosen because it allows for an in-depth exploration of students' real-life interactions with AI platforms, capturing nuanced insights into their learning behaviors, attitudes, and challenges (Baig & Saleem 2024). The participant were selected through purposive sampling, targeting students who had prior exposure to AI tools such as CHATGPT, Read theory, or Rewordify in their academic reading activities. A total of eighty (80) undergraduate students from Prince Abubakar Audu University Anyigba from eight faculties were included in the study, representing diverse academic disciplines and reading proficiency level. Data were collected using semi-structure interviews, which enabled participants express their experience freely while ensuring that core research questions were addressed. Interviews were conducted either face to face or via voice note, depending on participants' availability and preferences. Each interview lasted approximately 20-30 minutes and was conducted in English language, based on the participants' comfort level. All interviews were audio- recorded with consent, then transcribe and translated were necessary. The data were analyzed using thematic analysis following wrong and Braun Clarke's (2006) six –phase framework. This method allowed for the identification of recurring patterns and themes related to students' perception, benefits, challenges, and overall experience with AI tools. Ethical Protocols were strictly followed throughout the study. Participant were informed of the research objectives, and informed consents were obtained prior to participation. Anonymity and confidentiality were maintained and participation were voluntary. The collected data were used solely for academic purposes and stored securely. This methodology enabled rich, contextual understanding of how AI technologies are influencing reading development among undergraduate students in a developing country context, contributing valuable insights for future educational integration.

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Presentation of Results

The results showed the important of research and explored how undergraduate students of Prince Abubakar Audu University Anyigba perceive and experience the use of AI tools to enhance their reading proficiency. Data were collected through semi-structured interviews with students who had experience in using AI tools such as CHATGPT, Read Theory, and Rewordify. Thematic analysis was employed to identify patterns in students' perceptions experiences, and challenges. Many students reported that AI tools provided are more personalized learning experience compared to traditional methods. Tools like Read theory and ChatGPT adjusted the difficulty level of reading passages according to the learner's performance, which helped in targeting individual learning needs. This adaptive approach allowed students to progress at their own pace, revisit difficult sections, and manage learning time more efficiently. However, a few participants acknowledged that the effectiveness of self-paced learning heavily depends on the learner's self-discipline and motivation. Some admitted to delaying tasks, skipping activities, or not following through with lessons regularly, which reduced their ability to benefit fully from AI tools. Students widely appreciated the vocabulary support and real-time explanations provided by AI tools. They found it easier to understand academic texts, especially when unfamiliar words were automatically simplified or defined. This in turn, enhanced their fluency and overall comprehension.

Nevertheless, some students expressed concern that such simplification could create a dependency. They noted that while AI tools helped in the short term, sometimes limited opportunities to develop strategies for tackling complex vocabulary independently, skills essential for academic success in higher education. The interactive features, instant feedback, and gamified progress indicators of AI reading tools were highlighted as motivating factors. Students found reading tasks more enjoyable and felt a sense of achievement when they reached milestones or improved scores. The digital format also helped reduce reading anxiety for some students. Despite this, a few participants shared that the initial excitement wore off over time, especially without external accountability or peer comparison. The absence of teacher interaction and face-to-face encouragement made it harder for some to remain consistently engaged with the AI tools.

Q2: What benefits and challenges do undergraduate students encounter when using AI-based tools for enhancing reading comprehension?

Students with stable internet access and familiarity with technology found AI tools accessible and effective. They appreciated being able to use them on mobile phones or laptops, anytime and anywhere, which was particularly helpful during off-campus study sessions. However, participants from network disadvantages homes or rural backgrounds faced significant barriers, including slow internet outdated devices, and limited digital skills. These issues not only disrupted learning but also created disparities in how effectively different students could benefit from AI based reading support. Many students described AI tools as helpful aids for clarifying texts, building confidence and developing consistent reading habits. The tools allowed them to get instant explanations and summaries, which saved time and supported understanding. Many students described AI tools as helpful aids for clarifying texts, building confidence and developing consistent reading habits. The tools allowed them to get instant explanations and summaries, which saved time and supported understanding.

On the downside, some students admitted to become overly dependent on AI-generated answers, summaries, or paraphrasing tools. This dependency sometimes discouraged them from analyzing content critically or attempting to understand difficult passages on their own, which could affect their long-term reading independence. The majority of the students indicated that regular use of AI tools improved their confidence in reading and complex academic texts. They felt better prepared for exams, assignments, and class discussions, especially after practicing with AI-generated quizzes or explanations. However, this confidence was not consistent across all users. Students who used the tools irregularly or without proper guidance found that their preparation was sometimes inadequate. Moreover, some pointed out that the content provided by AI tools didn't always align with their course syllabus, leading to gaps in understanding during formal assessments.

Discussion of Findings

The findings of this research revealed that the use of AI tools in academic settings not only introduced a new way of learning for students but also represented a shift in how educational support is delivered outside traditional classroom boundaries. Students in this study expressed that AI tools such as ChatGPT, Read Theory, and Rewordify significantly

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contributed to the development of their reading proficiency by offering personalized learning paths and instant support. These tools helped learners build confidence and fluency, especially when engaging with complex academic texts. The availability of simplified explanations and adaptive reading content allowed students to study at their own pace, which contributed to greater comprehension and vocabulary enhancement. Furthermore, students reported that features such as gamification, real time feedback, and interactive tasks made reading more engaging and enjoyable. This aligned with the work of Khan and Rasheed (2023), who found that AI-supported learning platforms improved learner engagement and motivation through adaptive and user-friendly interfaces. The findings also reflect the principle of Vygotsky's Sociocultural Theory, (1978) where AI tools acted as digital scaffolds, supporting students within their Zone of Proximal Development and encouraging independent learning. However, the study also uncovered multiple challenges. Some students struggled with maintaining consistent usage due to limited self-discipline, time management issues, or a lack of accountability. These issues are similar to those raised by Chen et al. (2021), who discussed how over-reliance on AI can hinder student's critical thinking and reduce their ability to read independently without digital assistance. Additionally, students from under privilege backgrounds faced significant barriers, including limited internet access, outdated devices, and low digital literacy, which created inequality in learning outcomes. These obstacles align with Baig and Saleem (2024), who highlighted that digital divides can impact the effective use of AI technologies in education, particularly in rural and low-incomes regions. In a nutshell, the results suggested that when AI tools are integrated with proper institutional support such as digital training, access to reliable internet, and alignment with curriculum objectives they can play a transformative role in improving students' academic reading proficiency. The tools not only support comprehension and vocabulary development but also promote learner autonomy and motivation. Therefore, a balanced and inclusive implementation of AI-based learning tools has the potential to bridge instructional gaps and enhance academic literacy, especially in developing country context like Nigeria in general and in Prince Abubakar Audu University, Anyigba, Kogi State in particular.

Conclusion

In conclusion, AI tools have the potential to enhance academic reading proficiency when used thoughtfully and consistently. To maximize their impact, educational institutions must ensure equitable access, provide training for both students and instructors, and align AI tools with curriculum goals. Future research should focus on long-term outcomes, teacher perspectives, and strategies for integrating AI into border literacy instruction. By addressing these dimensions, AI can become a valuable complement to traditional teaching methods, fostering more inclusive and effective learning environments.

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Effects of Multimedia Aids on Academic Achievement among Private Secondary School Students in Oyo State, Nigeria

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Abstract

This study examined the relationship between selected emerging global innovations and students' academic achievement in private secondary schools in Oyo State, Nigeria. Using a descriptive survey design, 1,500 teachers from 150 private secondary schools across the three senatorial districts were sampled through a multi-stage procedure. Data were collected with the Emerging New Global Innovations and Students' Academic Achievement Questionnaire (ENGISAAQ), whose reliability was established (r = 0.85). Analyses included descriptive statistics, Pearson correlations, multiple linear regression (with robust standard errors), one-way ANOVA, reliability checks, effect sizes, and robustness tests. Results showed that WhatsApp/SMS usage is a significant positive predictor of students' academic achievement, while computer-based testing (CBT) and projector/slides usage were not significant. No significant differences were observed across senatorial districts. Subgroup analysis revealed stronger WhatsApp/SMS effects among more experienced teachers. The paper discusses implications for ICT policy and teacher capacity building.

Keywords: *emerging innovations, ICT, private secondary schools, academic achievement, educational management*

Introduction

The 21st-century educational landscape is increasingly influenced by rapid technological innovations. Effective integration of information and communication technologies (ICT) in schools enhances access to resources, enables new pedagogical approaches, and can improve student outcomes. In Nigeria, adoption of innovations such as computer-based testing (CBT), multimedia projectors, and mobile messaging platforms varies widely between schools and regions. Private secondary schools are often expected to lead in innovation adoption but face infrastructural and capacity constraints. This study investigates the influence of selected emerging global innovations — electronic assignments/CBT, projectors/slides, and WhatsApp/SMS messaging — on students' academic achievement in private secondary schools in Oyo State. Understanding which innovations influence outcomes most strongly can guide interventions and policy priorities, particularly in resource-constrained contexts. One of the objectives of secondary education in Nigeria is to equip students to live reflectively in our modern age of science, technology, and commerce. Incorporating effective uses of technology for teaching is also complex on its own terms. Mishra *et al* (2016) argued that the best uses of educational technology must be grounded in a creative mindset that embraces openness for the new and intellectual opportunity. This is a tremendous challenge for any teacher, but especially new teachers. It has not been addressed in great detail by professional development. Focusing on ICT helps us use creativity as a driver for good teaching with technology. One of the key affordances of digital technologies is that content or knowledge can be created, shared, and discovered much more quickly and easily (Henriksen *et al*., 2016). With digital media contributing to globalization and diversification of ideas and content, there has been a rethinking of how we communicate and share ideas, art, culture, and other forms of content. Adedokun and Abidoye (2020) submitted that new technology, such as the use of projects (Overhead and normal), slides, videoconferencing, Teletutorial, Telelectures, Teleseminar, has much to offer to the world of creativity in student ability

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and skills needed to learn to find the particular contents and curriculum they require. More so, it has been observed that sharing as seen in internet crowd-sourcing of data or ideas, new applications for content development, creating unique or remixed work, WhatsApp, T- talk, YouTube, Sound Cloud, Vimeo, sharing video/audio/images/text across global contexts, and websites promote diverse creativity to share contents to the learners in the classroom (Henriksen, *et al*., 2016). This explosion in technologies for content sharing and development is transforming how culture, art, and knowledge emerge within disciplines. The use of ICT (information and communication technology) in passing instruction during teaching and learning processes seems to be emerging. Aikonen, (2021) noted that the usage of ICT in the Education Instruction process came late in the 1990s, with very little interest shown. He thinks that computers used as teaching machines date from 1958; early development took place at IBM's Watson Research Centre and the University of Illinois. Thus, for over a period of thirty years, it was not employed in teaching and learning in the Education sector (Aikonen, 2021). However, a greater level of integration can be achieved through the involvement of teachers in developing curriculum content and the application of the appropriate media to enhance instruction.

The Current age is the information age, which requires having information and making relations for getting the required information (Adedokun and Abidoye, 2020). Many researchers view information society as a structure and multi-dimensional society in which all layers and levels require information (Jenks and Springer, 2021). Information and Communication Technology (ICT) has become a topic of discussion in the technological arena and its applications in different sectors, and education in particular. Information and Communication Technologies (ICTs) are generally accepted as a modern education tool that enables educators to modify the teaching method they use to increase the students' performance. Mishra and Henriksen (2020) opined that in the modern culture of science and technology, the competence of science staff in educational attainment is gauged by the training they acquired and their effective utilization of ICT facilities in conducting students' exams, class tests, and students' assignments. When this ICT is well utilised, it would enhance the academic performance of students in schools. Unfortunately, a vast majority of teachers in secondary schools are deficient in these areas. There are two key aspects to the role of technology and creativity in the classroom. The first is that educators must be creative in devising new ways of thinking about technology, particularly for teaching specific content. More importantly, most digital tools (be it Facebook, a smartphone, or any other tool) have usually not been designed for educational purposes. It becomes an opportunity for the teacher to creatively repurpose existing tools for educational purposes (Koehler and Mishra., 2016). Second, it is also clear that technologies afford new ways of constructing, representing, communicating, and sharing knowledge, providing opportunities for creative output by and between students that were not possible before. It is important to note the significance of teacher beliefs about creativity and technology. There is research indicating that teacher beliefs about subject matter, learning, teaching, and technology influence the way they approach practice (Ertmer *et al*, 2017).

Aikonen (2021) submitted that the acquisition, deployment, and management of information technology resources and services for teaching depend on electricity. In addition, many teachers today have never used computers in their lives, and they are terribly shy when they are confronted with this new technology and the terminology associated with using them. Some schools do not have them provided for their teachers, and some teachers may not be economically buoyant enough to buy one for themselves. The innovations have undergone rapid development in the last 20 years. When technology is properly integrated in educational curricula, learners will learn more than the core subjects, while technology learning and application will take place. ICT involves equipment and other related media materials, with primary consideration based on available equipment to aid instruction, while the secondary consideration is based on how available equipment could be effectively and efficiently utilized. (Aikonen, 2021). The internet has granted students the power to learn at their convenience, also where they like. They can use the internet to solve any problem as well as ask the online community to resolve their issues. Students can be in touch with their fellow students and even with their teacher for better communication, and hence the internet has increased the productivity of students and the tendency to solve problems on their own. The Federal Republic of Nigeria in the National Policy on Education (FRN, 2013), is the government's way of achieving that part of its national objectives that can be achieved using education as a tool. It could therefore be said that technology in education enhances the teaching and learning process; improves education and facilitates learning processes, and enables students to be creative, and gives technological compatibility.

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Statement of the Problem

In recent times, there have been many inventions of high technologies which have been designed and adopted by advanced countries, and this has brought total positive changes in the process of teaching and learning. In Nigeria, however, it seems many students are being left behind in total learning. This may be a result of poor innovation that could not enhance proper classroom management during teaching by the instructors. This challenge has led to poor educational development in secondary education, particularly in private secondary schools. This has become a serious concern for education stakeholders. A result of poor innovation, classroom activities seem to be handled in an unfitting manner by the teachers, and this is affecting the educational development. Previous studies focused on school facilities, staffing factors, policy factors, and student factors as determinants of students' performance with little emphasis on emerging new global innovations. This study thus examined emerging new global innovations and students' academic achievement in private secondary schools in Oyo State.

Objectives of the Study

The study investigated the emerging new global innovations and students' academic achievement in private secondary schools in Oyo State. Specifically, to:

1. find out the influence of Electronic Assignment/ Test& CBT Exams on the students' academic achievement in private secondary schools in Oyo State.
2. examine the relationship between the use of projectors/ and the students' academic achievement in private secondary schools in Oyo State.
3. assess if there is any relationship using WhatsApp messages and students' academic achievement in private secondary schools in Oyo State.

Research Questions

1. What is the relationship between electronic assignments/CBT examinations and students' academic achievement?
2. What is the relationship between the use of projectors/slides and students' academic achievement?
3. What is the relationship between SMS/WhatsApp usage and students' academic achievement?

Hypotheses

The following hypotheses were raised and tested at the 0.05 level of significance

H_{o1}: There is no significant relationship between the use of electronic assignment/e-test & CBT examination and students' academic achievement in private secondary schools in Oyo State

H_{o2}: There is no significant relationship between projectors/slides usage and students' academic achievement.

H_{03}: There is no significant relationship between the use of SMS/3WhatsApp messages and students' academic achievement in private secondary schools in Oyo State.

Materials and Methods

The study design employed a descriptive survey. The population of the study were all teachers in private secondary schools in Oyo State, while One Thousand and Five Hundred teachers were sampled through. Multi-Stage Sampling Technique in all three (3) senatorial districts in Oyo State were identified (Oyo North, Oyo South, and Oyo Central). Thus, Five Local Government Areas (LGAs) were randomly selected through Simple Random Sampling Techniques. A total of 15 LGAs were used for the study; In each LGA, 10 private secondary schools were randomly selected through Simple Random Sampling Techniques. A total of 150private secondary schools were used for the study; From each private secondary school, 10 classroom teachers were randomly selected through Simple Random Sampling Techniques; A total of 1,500 respondents were used for the study. An instrument labelled "Emerging New Global Innovations and Students' Academic Achievement Questionnaire (ENGISAAQ)" was used to collect data. The questionnaire was divided into two (4) sections. Section A contained the respondent's personal data, while sections B, C, and D consisted of ten items each on the uses of electronic assignment/ test & CBT Examination, uses of the projector, and using WhatsApp messages. In consideration of content validity, the instrument was given to the experts in the field of Educational Management and Teachers' Education for scrutiny. Corrections were made before the administration of the questionnaire. For the reliability, two private secondary schools that were not part of the selected schools were used. Test and re-test methods were used, and a reliability coefficient of r 0.85 was obtained. Descriptive stats, correlations, regression with robust SEs, ANOVA, reliability checks, effect sizes, subgroup and robustness analyses at 0.05 level of significance.

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Presentation of Results

Testing of Hypotheses

Table:1

Descriptive Statistics of Study Variables (N = 1,500)

Variable	Mean	SD	Min	Max
CBT Score	32.83	15.93	0.00	82.55
Projector Score	21.26	1.06	18.40	24.51
WhatsApp/SMS Score	8.62	5.33	0.00	28.10
Academic Achievement	60.04	12.16	21.71	100.00

Interpretation: WhatsApp/SMS use was positively linked with higher achievement.

Table:2

Pearson Correlations Between Innovations and Academic Achievement (N = 1,500)

Predictor	r	95% CI Lower	95% CI Upper	P
CBT Score	0.008	–0.043	0.058	.766
Projector Score	0.017	–0.033	0.067	.402
WhatsApp/SMS Score	0.220	0.171	0.268	<.001

Interpretation: WhatsApp/SMS showed a significant positive correlation with achievement.

Table:3

Multiple Regression Predicting Academic Achievement (N = 1,500)

Predictor	B	SE	β	T	P
Constant	59.87	0.68	—	88.04	<.001
CBT Score	0.01	0.01	.01	0.30	.766
Projector Score	0.02	0.02	.01	0.81	0.418
WhatsApp/SMS Score	0.50	0.07	.22	7.15	<.001
District (Central)	–0.84	0.62	–.03	–1.35	0.177
District (South)	–0.45	0.61	–.02	–0.74	0.460

Model Fit: $R^2 = .049$, Adjusted $R^2 = .046$, $F(5, 1494) = 15.29$, $p < .001$. Cohen's $f^2 = .05$ (small effect size).

Interpretation: WhatsApp/SMS significantly predicted academic achievement. CBT and projectors were non-significant.

Table:4

One-Way ANOVA of Academic Achievement by District (N = 1,500)

Source	SS	df	MS	F	P	η^2
District	548.44	2	274.22	1.86	0.156	0.005
Error	221,008.9	1,497	147.65			
Total	221,557.3	1,499				

Interpretation: No significant differences in achievement across districts ($p = .156$). Effect size negligible ($\eta^2 = .005$).

Table:5

Subgroup Regression: WhatsApp/SMS by Teacher Experience

Group	B	SE	B	P
>10years experience	0.55	0.08	.25	<.001
≤10years experience	0.41	0.09	.18	0.002

Interpretation: WhatsApp/SMS effects were stronger among more experienced teachers.

Interaction Effects: Adding WhatsApp and Senatorial District interactions showed non-significant effects ($p = .322$), suggesting consistent WhatsApp/SMS influence across districts.

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Discussion of Findings

The findings highlight WhatsApp/SMS as a low-cost, high-impact innovation with consistent positive influence on student outcomes. This finding attests to the conclusion of Henriksen, et al., 2016) that it has been observed that sharing as seen in internet crowd-sourcing of data or ideas, new applications for content development, creating unique or remixed work, WhatsApp, T- talk, YouTube, Sound Cloud, Vimeo, sharing video/audio/images/text across global contexts, and websites promote diverse creativity to share contents to the learners in the classroom. CBT and projectors, while popular in policy, showed no significant predictive power, aligning with studies stressing the need for training and infrastructure (Adedokun and Abidoye, 2020). Subgroup analysis suggests experienced teachers are more adept at integrating WhatsApp/SMS effectively. District-level differences were negligible, underscoring school-level innovation over geography.

Conclusion

From the discussion, it is seen that the usage of innovation in teaching and learning in private secondary schools enables students to expand knowledge, experience, and increase understanding, especially in the use of required visual, audio, maps, video presentations, and so on. Strengthening teacher training in digital pedagogy and WhatsApp/SMS use is essential. Besides, Government and educational administrators should encourage structured WhatsApp/SMS channels for assignments and communication. Invest in CBT/multimedia only with parallel infrastructure and training support. Teachers who are weak in the use of ICT need to participate in ICT training courses. Conduct longitudinal research to track sustained impacts, and the scope of innovation amongst teachers needs to be encouraged.

Limitations

The data collected and analysed were limited to private schools in Oyo State only. Public secondary schools should also be considered for further research. Besides, a comparative analysis of both private and secondary schools should be conducted.

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Teachers' Preparedness for Inclusive Education at Secondary School Level of Education in Nigeria: Policy Compliance in the Era of the Fifth Industrial Revolution

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Abstract

The Fifth Industrial Revolution (5IR) presents significant opportunities for inclusive education by integrating emerging technologies such as artificial intelligence (AI), adaptive learning tools, and assistive technologies into teaching and learning processes. Unlike the Fourth Industrial Revolution (4IR), which emphasised digital transformation and automation, 5IR focuses on human-centered innovation, fostering collaboration between technology and educators to enhance learning outcomes. The reality of what the Nigerian government has achieved in the 4IR has brought to the forefront the debate on the nation's preparedness for the 5IR, particularly in the education sector. While policies advocating for inclusive education exist, their implementation remains a challenge due to gaps in teacher training, digital literacy, and the availability of necessary resources. This study examines the preparedness of teachers in Nigerian secondary schools to implement inclusive education policies and comply with regulatory frameworks in the context of 5IR. Key challenges identified include inadequate professional development programs, limited access to assistive technologies, insufficient funding, and weak policy enforcement mechanisms. Many teachers lack the technical skills required to integrate digital tools effectively into inclusive education practices. To address these challenges, this paper recommends targeted investment in continuous professional development, integration of assistive technologies into teacher education curricula, provision of adequate teaching resources, and strengthening policy implementation. These measures are essential to ensuring that inclusive education policies are effectively translated into meaningful learning experiences for all students, thereby fostering educational equity and innovation in the 5IR era.

Keywords: Assistive technology, Fifth Industrial Revolution, inclusive education, policy compliance, teacher preparedness

Introduction

The concept of inclusive education emphasises the right of all students, regardless of their abilities or disabilities, to access quality education in a conducive learning environment (UNESCO, 2020). In the era of the Fifth Industrial Revolution (5IR), characterised by the fusion of human intelligence and emerging technologies such as artificial intelligence (AI), robotics, and personalised learning, the role of teachers in implementing inclusive education policies has become more critical than ever (Schwab, 2019). The 5IR promotes a human-centric approach that ensures technological advancements cater to the diverse needs of learners, particularly those with disabilities (Lee, 2021). This shift requires teachers to be well-equipped with the knowledge and skills to integrate digital tools into their pedagogy while ensuring inclusivity in secondary education. Inclusive education is not merely a moral imperative but a strategic necessity for fostering equitable learning environments where all students can thrive. According to Sustainable Development Goal 4 (SDG 4), which focuses on ensuring inclusive and equitable quality education for all, nations are encouraged to create education systems that accommodate diverse learner profiles (United Nations, 2015). In Nigeria, where secondary schools serve an increasingly diverse student population, the successful implementation of inclusive education policies is pivotal to achieving this global commitment. However, achieving inclusivity in a technology-driven era demands more than policy frameworks; it requires educators who are digitally literate, adaptable, and empathetic towards students with varying abilities. Despite existing policies advocating for inclusive education, there are significant challenges in implementation, particularly concerning teacher preparedness and policy compliance in Nigeria. Many educators lack adequate training in assistive technologies, digital literacy, and adaptive teaching methods that align with 5IR requirements (Ajayi et al., 2022). Moreover, disparities in access to educational technology further exacerbate the exclusion of students with special needs. The urban-rural digital divide, insufficient infrastructure, and limited funding for special education resources compound the problem, making it difficult for teachers to create inclusive learning experiences. Additionally, systemic issues such as inadequate monitoring, weak enforcement of inclusive education policies, and cultural stigmas surrounding disabilities continue to undermine progress.

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Addressing these gaps is crucial to ensuring that inclusive education policies translate into meaningful learning experiences for all students. This requires a multifaceted approach involving teacher capacity development, infrastructure improvement, and sustained policy enforcement. Collaboration among stakeholders, including the government, school administrators, non-governmental organisations (NGOs), technology providers, and teacher training institutions, is essential to creating an enabling environment for inclusive education in Nigeria's secondary schools. This paper examines the preparedness of teachers in Nigerian secondary schools to implement inclusive education policies using emerging technologies and assesses the level of policy compliance in this regard. It also explores the barriers to effective implementation and offers strategic recommendations to enhance teacher training, promote equitable access to digital resources, and strengthen policy enforcement mechanisms. Ultimately, fostering an inclusive, technology-enhanced learning environment is crucial to empowering all students, including those with disabilities, with the aim of reaching their full potential in the 5IR landscape.

Conceptualising Inclusive Education in the 5th Industrial Revolution Era

The Fifth Industrial Revolution (5IR) represents a significant shift from the digital transformation of the Fourth Industrial Revolution (4IR) by prioritising human-centred technological advancements. While the 4IR emphasised automation, efficiency, and data-driven decision-making, the 5IR focuses on the seamless integration of artificial intelligence (AI) and other emerging technologies with a strong emphasis on personalisation, ethics, and inclusivity in education (Lee, 2021). This transformation aims to ensure that technology serves all learners equitably, including those with disabilities, thereby advancing global efforts to create more accessible and inclusive learning environments (Obi & Adeyemi, 2023). Inclusive education in the 5IR era requires educators to go beyond basic digital literacy and develop specialised competencies in leveraging assistive technologies and adaptive learning platforms to support students with diverse learning needs (Adebayo & Uche, 2022). The use of AI-driven personalised learning software, speech-to-text applications, virtual reality (VR) simulations, and augmented reality (AR) tools has transformed teaching and learning by offering innovative ways to enhance engagement and accessibility. These technologies enable students with physical, sensory, or cognitive impairments to actively participate in classroom activities, bridging gaps in traditional learning methods (Bello & Yusuf, 2021). Additionally, ethical AI integration in education ensures that digital learning systems are designed to reduce biases and provide equitable learning experiences. AI-powered analytics can assist teachers in identifying students who are struggling academically and implementing targeted interventions based on individual learning patterns. For example, adaptive learning platforms use real-time data to adjust instructional content to match the pace and ability of each learner, ensuring that no student is left behind (Eze & Ogundele, 2020). Such innovations foster inclusive classroom environments where students with disabilities receive tailored support that aligns with their specific needs. However, achieving inclusive education in the 5IR era goes beyond technological advancements; it requires strategic policy implementation, teacher training, and infrastructural readiness. National policies must explicitly promote equity, accessibility, and the integration of emerging technologies in secondary education. Schools need adequate resources to implement these changes effectively, ensuring that assistive tools are available and that digital infrastructures are accessible to all students, including those in underserved communities. The success of inclusive education in this era is largely dependent on the preparedness of educators. Teachers must be trained to harness the potential of AI, VR, and other digital innovations to create personalised learning experiences. Professional development programmes should focus on equipping teachers with the necessary skills to integrate assistive technologies into lesson planning, assessment, and classroom management. Without adequate training, even the most advanced technological tools will fail to achieve their intended impact on inclusive education (Adebayo & Uche, 2022).

Teacher Preparedness in the Era of 5th Industrial Revolution

The successful implementation of inclusive education in the 5IR era demands a redefinition of teacher competencies. Beyond traditional pedagogical skills, teachers must be equipped with digital fluency, ethical sensitivity, and adaptive teaching strategies (Redecker, 2017). They must be capable of using technology to differentiate instruction and provide personalised support to diverse learners. Unfortunately, current teacher preparation programmes in Nigeria are largely outdated and do not adequately address the demands of inclusive and technologically driven education (Ezegbe, 2015). There is a significant preparedness gap, marked by inadequate exposure to inclusive pedagogies, limited use of ICT in teacher training, and poor access to continuous professional development opportunities.

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Policy Compliance: Issues and Challenges

Policy compliance among teachers is influenced by multiple factors, including their understanding of policy provisions, availability of resources, administrative support, and perceived relevance of policies to classroom realities (Lipsky, 1980; Oloruntegbe, 2011). In many cases, teachers in Nigerian secondary schools operate under constrained conditions, which affect their ability to comply with inclusive education policies. High student-teacher ratios, lack of instructional materials, and insufficient training limit their capacity to implement inclusive strategies. Moreover, there is a disconnect between policy formulation and implementation. Policies are often top-down and fail to engage teachers as critical stakeholders in the implementation process (Arinze & Okoli, 2015). As a result, compliance becomes mechanical or selective, rather than transformative. It is important to note that the 5IR presents an opportunity to reshape inclusive education by merging technological innovation with human-centred approaches. By embracing AI-driven solutions, adaptive learning platforms, and ethical digital integration, education systems can foster environments where every student—regardless of ability—can access quality learning experiences. However, to realise this vision, policymakers, educators, and stakeholders must work collaboratively to ensure the equitable implementation of technology in education.

Policy Frameworks for Inclusive Education in Nigeria

Inclusive education is a global agenda that promotes equal access to quality education for all learners, irrespective of their abilities or backgrounds. Nigeria, in alignment with international commitments such as the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) and the Sustainable Development Goals (SDGs), has established several national policy frameworks to support inclusive education.

1. National Policy on Education (NPE) is the foundational document on which the structure of education in Nigeria is premised. It was first published in 1977 and most recently revised in 2013. It advocates for inclusive education by encouraging the integration of learners with special needs into mainstream schools and highlights the need for teacher training, curriculum adaptation, and the establishment of special education units (Federal Ministry of Education [FME], 2013). Despite these provisions, challenges such as limited resources, inadequate infrastructure, and poor teacher preparedness hinder effective implementation.
2. National Policy on Special Needs Education (2015), is a complimentary policy document to the NPE. It specifically addresses the education of children with disabilities, the gifted, and other marginalised groups. This policy underscores continuous professional development for teachers in inclusive pedagogies, behaviour management, and the use of assistive technologies. It promotes stakeholder collaboration, particularly with NGOs and community groups, to mobilise resources and reduce stigma (FME, 2015). Nevertheless, implementation remains weak due to limited funding and infrastructural gaps.
3. The Universal Basic Education (UBE) Act of 2004 guarantees free and compulsory education for all Nigerian children, including those with disabilities. It mandates the establishment of inclusive schools and the provision of specialised learning materials and personnel (UBEC, 2017). However, a lack of teacher training and inadequate facilities continue to restrict its impact, especially in rural areas.
4. The Discrimination Against Persons with Disabilities (Prohibition) Act (2018), is a significant legal document which was developed to prohibit all forms of discrimination and requires schools to provide reasonable accommodation for learners with disabilities. It enforces inclusive admission policies and mandates accessible infrastructure, offering legal recourse for individuals facing discrimination (Federal Republic of Nigeria, 2018).
5. The National Policy on Inclusive Education in Nigeria (2023) presents a comprehensive framework to ensure equitable access to quality education for all learners, regardless of disability, socio-economic status, or gender. It promotes non-discriminatory, enabling learning environments through inclusive pedagogies, assistive technologies, and flexible curriculum adaptation (National Policy on Inclusive Education in Nigeria, 2023). The policy is aligned with Education 5.0 which is characterised by artificial intelligence, virtual reality, and automation, requiring teachers to possess competencies in digital literacy, adaptive pedagogy, and data-informed instruction (Ahmad et al, 2023).

To foster teacher preparedness, the policy emphasises continuous professional development in inclusive strategies such as Universal Design for Learning (UDL), differentiated instruction, and co-teaching. The Federal Ministry of Education, in collaboration with agencies like NSSEC and Google, is training secondary school teachers in AI and digital tools, embedding 5IR principles into classrooms.

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Additionally, inclusive education content has been integrated into pre-service teacher education curricula in line with NCCE standards, while UBEC and development partners like UNICEF and DFID support in-service training. The policy promotes the use of assistive technologies, including speech-to-text software and screen magnifiers, to enhance learning for students with disabilities and those from marginalised groups. Programmes like the 3 million Technical Talent (3MTT) initiative further support teachers in engaging with emerging technologies (National Information Technology Development Agency, 2023). Compliance mechanisms now require teachers to demonstrate proficiency in inclusive and digital teaching. Schools must implement inclusive policies, offer reasonable accommodations, and adapt curricula to learners' needs (Pinnock, 2020). Oversight is provided by institutions such as the Federal and State Ministries of Education, UBEC, NCCE, and NCPWD, with support from private sector partners. Despite these efforts, implementation faces challenges including inadequate training, poor infrastructure, limited mentorship, and unequal funding. These barriers threaten the effectiveness and equity of inclusive education in Nigeria. Nonetheless, the policy reflects a significant step toward an inclusive, technology-driven educational future.

Challenges and Gaps in Policy Implementation

According to the Federal Republic of Nigeria (2013) in National Policy on Education (section 9 sub-section 139 (g)), States Ministries of Education are not just to provide appropriate education policies, they are equally to ensure their enforcement (Popoola, 2019). Despite the existence of several policies designed to promote inclusive education in Nigeria, significant gaps persist in their implementation. These gaps are particularly evident in teacher preparedness, availability of infrastructure, and compliance with technological integration in inclusive education. According to Ogunleye (2019), many public secondary schools in Nigeria still lack the infrastructure necessary to implement inclusive education effectively, which further widens the gap between policy and practice. Additionally, Okoro (2020) highlights the limited collaboration between government agencies, educational institutions, and private sector stakeholders, which results in fragmented efforts, thereby hindering sustainable progress in inclusive education. These challenges are explored in detail below.

Inadequate Funding

One of the most pressing barriers to the successful implementation of inclusive education policies in Nigeria is inadequate funding. Limited financial resources hinder the construction of accessible infrastructure, the procurement of assistive technologies, and the provision of specialised training programmes for teachers. Without sufficient funding, many schools struggle to provide the necessary facilities to accommodate learners with disabilities. Many public schools, particularly those in rural areas, lack essential infrastructure such as ramps, accessible restrooms, and designated learning spaces for children with special needs (Ajuwon, 2012). The absence of these facilities not only prevents children with disabilities from accessing education but also limits their ability to engage effectively in learning activities. Furthermore, assistive technologies—such as braille materials, hearing aids, and communication devices—are expensive and remain unaffordable for most public schools and families. Consequently, learners who require these resources are often left without the necessary support to thrive in mainstream classrooms (Obiakor & Offor, 2011). In addition, inadequate funding affects teacher training and professional development. Many teacher training institutions lack the resources to incorporate comprehensive courses on inclusive education. As a result, teachers often enter the profession without the skills required to support diverse learners, thereby exacerbating the challenges of inclusion.

Teacher Capacity and Training Deficiencies

Another significant obstacle to the effective implementation of inclusive education is the lack of teacher preparedness. Many teachers in Nigeria lack the knowledge, skills, and confidence to manage diverse classrooms effectively. Teacher education programmes in the country often provide little to no training on inclusive pedagogies, differentiated instruction, or behaviour management strategies for learners with special needs (Eleweke & Rodda, 2002). Without adequate training, teachers may unintentionally exclude or neglect learners with disabilities, thereby impeding their academic progress and social integration. The absence of specialised training also means that teachers may not be equipped to use assistive technologies or adapt lesson plans to accommodate students with different learning needs. In some cases, educators may struggle with identifying disabilities in students, leading to misinterpretations of learning difficulties as behavioural issues rather than cognitive or developmental challenges. This further affects the learning outcomes of children with disabilities.

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Furthermore, many teachers experience excessive workloads and large class sizes, making it difficult for them to provide individualised attention to students who require additional support. In the absence of additional teaching assistants or special education professionals, mainstream teachers are often unable to meet the needs of all learners effectively.

Cultural and Social Barriers

Deeply rooted societal perceptions and cultural biases also contribute significantly to the challenges faced in implementing inclusive education in Nigeria. There remains a widespread stigma associated with disabilities, leading to discriminatory attitudes that affect both families and schools. Some families, due to shame or societal pressure, hide their children with disabilities rather than enrolling them in school. Others perceive children with disabilities as incapable of learning and, as a result, do not prioritise their education. In schools, learners with disabilities may face bullying, discrimination, or isolation from both peers and educators. Teachers who lack training in inclusive education may have negative perceptions of students with disabilities, leading to lower expectations and reduced engagement in their learning process. This creates a discouraging environment for students with special needs, making it even more difficult for them to succeed in mainstream classrooms (Abang, 2005). Overcoming these cultural barriers requires sustained community engagement, advocacy, and public awareness campaigns. Parents, educators, and community leaders must be involved in changing societal attitudes towards disability and promoting the value of inclusive education for all learners. Government agencies and non-governmental organisations (NGOs) have a role to play in sensitising communities on the importance of supporting children with disabilities in accessing quality education.

Weak Monitoring and Evaluation Mechanisms

It is assumed that policy is as good as the extent to which it is complied with but the objective for formulating such policy might not be achieved if the process that is expected to ensure compliance is compromised (Popoola, 2019). The absence of effective monitoring and evaluation systems remains another major challenge in the implementation of inclusive education policies in Nigeria. Many schools do not collect data on the enrolment, retention, or performance of learners with disabilities, making it difficult to assess progress and identify gaps in policy implementation (Garuba, 2003). Without reliable data, policymakers struggle to develop targeted interventions to improve inclusive education. Furthermore, a lack of accountability mechanisms means that many schools do not adhere to national policies on inclusive education. Schools may fail to provide the required support services for learners with disabilities, yet there are often no consequences for non-compliance. In some cases, allocated funds for inclusive education may be mismanaged or diverted, further hindering progress. These are challenges which must be addressed by the Nigerian government and other stakeholders concerned with the education enterprise.

Conclusion

The era of the Fifth Industrial Revolution presents unique opportunities for inclusive education in Nigeria. However, teacher preparedness remains a significant determinant of policy compliance and successful implementation. Addressing training gaps, improving digital competence, and ensuring effective policy enforcement are crucial steps towards achieving a more inclusive secondary education system. Future research should explore the impact of emerging technologies on learning outcomes in inclusive classrooms.

Recommendations for the Study

1. Teacher Training: Continuous professional development programmes should systematically integrate digital competencies and inclusive pedagogical practices to prepare teachers for effective engagement within Fifth Industrial Revolution (5IR) learning environments.
2. Teacher Education Curriculum: Teacher education institutions should embed structured training in assistive technologies and digital fluency to enhance teachers' capacity to address diverse and individualised learning needs.
3. School Infrastructure: Governments and educational stakeholders should prioritise sustained investment in technologically advanced infrastructure to support inclusive, immersive, and innovation-driven learning ecosystems.
4. Mindset Development: Professional sensitisation initiatives should promote human-centred, collaborative, and inclusive orientations towards educational technology to strengthen meaningful 5IR adoption in schools.
5. Policy Monitoring: Regulatory frameworks should incorporate data-driven and AI-supported monitoring mechanisms to strengthen policy implementation, accountability, and continuous improvement in inclusive education delivery.

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Effect of School-Based Conflicts on Academic Performance among Senior Secondary School Students in Central Senatorial Zone of Zamfara State, Nigeria

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Abstract
The study investigated the Effect of School-based Conflict on Academic Performance of Senior Secondary School Students in Central Senatorial Zone of Zamfara State, Nigeria. The study was guided by research objectives which were translated into research questions and research hypotheses that were formulated and tested using one-sample t-test at a 0.05 level of significance. The study reviewed related empirical researches conducted on school-based conflict and academic performance of students. Descriptive survey design was adopted with a population of 12,325 senior secondary (SS2) students of which 7,606 are males with 4,719 females drawn from four (4) local government areas (Bungudu, Gusau, Maru and Tsafe) of the central zone of the State. A sample size of 378 was selected using proportionate and simple random sampling while purposive sampling was used to select schools. Data collected were analysed using simple percentages while mean and standard deviation were used to present responses of research questions. The study findings revealed among others 3.64% equivalent to 95% that there is relationship between school-based conflict and academic performance of students; it revealed that 3.50% equivalent to 95% of school administrators, teachers and counselors played important roles in managing and resolving school-based conflict. The study concluded that there is concrete relationship between student academic performance and school-based conflict; it also concluded that school administrators, teachers and counsellors play an important role in managing and resolving school-based conflict. The study therefore, recommended among other things that, conflict resolution strategies should be giving more consideration by the school administrators, teachers, counselors and students in the process of planning and implementation of school policies, so that school will achieve its desired objectives.
Keywords: *School-based conflict, Roles, Relationships, Academic Performance*

Introduction
Conflict is a phenomenon in human organizations that is essential and unavoidable, because where there is human interaction, there is a tendency of individual likes and dislikes. These agreements and disagreements among people and groups lead them to conflicts. Conflicts are neither constructive nor disruptive but the way and manner these are managed and resolved make them either positive or negative. Schools, like any other social organizations, experience one or other type of conflict. Different conflict management strategies are adopted for resolving conflict; mediation, negotiation, avoidance and collaboration (Ghaffar, 2019). The approaches used to resolve conflicts in a positive manner are crucial for organizational life because lack of success in conflict resolution will not only cause breakdown in the relationships among the personnel, it will also affect their performance, motivation and efforts negatively. Therefore, conflicts will also reflect on organizational goals. In this context, it is crucial to take necessary measures to prevent conflicts to occur and to generate solutions to satisfy the parties in case conflicts occur. The most important role and responsibility in this process are on the conflict managers and the individuals involved, in the conflicts that occur in school it's an indispensable reality of human life where human relationships are experienced (Goksoy and Argon, 2016). However, unresolved conflicts can lead to job dissatisfaction, high absenteeism and turnover, prolonged disruption of activities and lack of concerted effort by organization members. Methods used to manage conflicts in school are needed to solve conflicts and find possible solutions in the form of organizational optimization. Conflicts that occur in schools need to be managed properly by the head of school so that they have the potential to make the organization effective (Jantzi and Leithwood, 2016). Conflict is resolved through the method of problem solving (Omboko, 2020). Conflicts are not desired to generate failure simply because they are not managed well and therefore generate negative results. But the focus should be on how to manage the process instead of how to define it as a concept. School-based conflicts can take place between administrators-teachers, teachers-teachers, teachers-students or student-students or among the parents. It should be kept in mind that regardless of the type of conflict

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or the group that part take in it, conflicts will be more complicated unless they are resolved and people involved in the conflict may experience negative feelings (Valente and Lourenco, 2020). This will negatively affect the job performances of the personnel and will affect student academic performance in schools (Goksoy and Argon, 2016). Conflict can be harmful if it leads to a breakdown in communication and work relationships, as well as tension, argument, low performance in duty and hostility, all of which have an impact on the smooth operation of schools (Eze and Victor, 2022). This study assesses the effect of School-based Conflict on Academic Performance of Senior Secondary School Students in central senatorial zone of Zamfara State, Nigeria. This is done with a strong consideration on the relationship between school-based conflict and academic performance of students and the roles of school administrators, teachers and counsellors in managing and resolving school-based conflicts in Senior Secondary Schools in central senatorial zone of Zamfara State.

Research Objectives

The objective of the study is to assess the effect of school-based conflict on academic performance of Senior Secondary School Students in central senatorial zone of Zamfara State, Nigeria. But the specific objectives are:

1. Find out the relationship between School-based conflict and academic performance of senior Secondary School students in central senatorial zone of Zamfara State, Nigeria.
2. Determine the role of School administrators, teachers and counselors in managing and resolving School-based conflicts in Senior Secondary Schools in central senatorial zone of Zamfara State, Nigeria.

Hypotheses

Ha_1: There is significant difference on the relationship between School-based conflict and academic performance of Senior Secondary school students in central senatorial zone of Zamfara State, Nigeria.

Ha_1: There is significant difference on the role of School administrators, teachers and counselors in managing and resolving School-based conflicts in Senior Secondary Schools in central senatorial zone of Zamfara State, Nigeria.

Literature Review

School-based conflict

School conflict is described as the dispute between individuals or groups about ideas, interests, beliefs, and values within the school community (Nadar, 2022). The school is a microsystem of society where ongoing developments are represented. By preparing students, teachers, and parents to navigate a world characterized by rapid change and interpersonal tensions is an important role that schools play to supporting student's growth. According to Valente, Lourenco and Nemet (2020) conflicts between students and teachers, arise due to, misunderstandings of the teacher's explanation, arbitrary grades and divergent evaluation criteria, a lack of didactic material, discrimination, disinterest in the course material, etc. Conflicts between students can also result through miscommunication, altercations, fighting, group rivalry, discrimination, bullying, usage of resources and places, dating, sexual harassment, loss or damage to school property, etc. Assaults between students and teachers, lost work materials, issues in the school canteen or similar setting, lack of teachers, lack of pedagogical support from teachers, evaluation, approval and disapproval criteria, and failure to meet administrative and bureaucratic requirements of management can all lead to conflicts between students, parents, teachers, and administrators (Nadar, 2022).

School conflict is a disagreement between opposing groups which comprises student- teacher conflict, student- student conflict and student-school community (Onyango, 2020). Conflict in schools can come in different forms; for example teachers seem reluctant to obey the principals, they do not seem to follow rules or accept extra work, they do not easily g*et al*ong with their authority heads. The principals also adopt an authoritative approach. They pressurize teachers for the uninterrupted school activities. It is very common that, conflict between teachers and the school authorities occur in the school almost every day. In institutions, conflict occurs between individuals, due to their frequent interaction with one another. Conflict is an expression of hostility, antagonism and misunderstanding between members in an organization (Ghaffar, 2019). The way educators and students understand the nature of conflict, the better they can manage conflicts constructively (Onyango, 2020). Conflicts as a concept never remain positive or negative but it has always been seen as a basic and result oriented part of school life. Conflicts offer competitive as well as cooperative context in the organization but it varies according to the situation. Problems exist in managing conflicts when the context is competitive, individualistic

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or when the context and the conflict resolution procedures are incongruent. The effectiveness of a conflict resolution and peer mediation programme may be limited when the classroom and school context is competitive (Ghaffar, 2019).

Theoretical Framework

The origins of the conflict perspective can be traced to the classic works of Karl Marx. Conflict theory of education is an ideology that focuses on how conflict function in educational context. Conflict theorists believe that conflict exists between socioeconomic groups. They also believe that conflict in public schools preserves social hierarchies; conflict theory states that, conflict occur between different groups because of limited resources (Deutschmann, Lorenz, Nardin, Natalini and Adalbert, 2020). Conflicts occur between students as a result of communication breakdown, tension, argument, inadequate resources like time, attention of teachers and facilities. Conflict theory, is a theory states that society is in a state of perpetual conflict because of competition for limited resources (Career Guide, 2022). Conflict theory holds that social order is maintained by domination and power, rather than by consensus and conformity. Central tenets of conflict theory are the concepts of social inequality, the division of resources and the conflicts that exist among different socioeconomic classes (Hayes, 2023). Conflict theory can be used to analyze power dynamics within the classroom. Students may have different levels of power and status based on their race, ethnicity, gender, social class or academic ability. Teachers may also have more power and authority than students, which can create tension and conflict. Conflict theory can help us understand how conflict related issues like power dynamics, social inequality and competing interest affects student academic performance (Naveed, 2021).

Types of Conflict in Schools

Conflict that exists in schools is mainly related to social and pedagogical changes Torrecilla, Olmos and Rodriquez (2016). Conflicts in school affect the quality of learning, student performance, teacher's performance and indirectly the community. Conflicts between students occur as a result of misinformation and previous experience related to certain issue, different perception for the same problem, different interest, motivation, personal objectives and inequitable resources allocation in the school, limited opportunities for career advancement, subjective appraisal of student performance and breaches in rules and regulations (Catana, 2015). Conflict theory of education is an ideology that focuses on how conflict function in educational context. Conflicts occur between students as a result of communication breakdown, tension, argument, inadequate resources like time, attention of teachers and facilities (Career Guide, 2022). Conflict theory can help us understand how conflict related issues like power dynamics, social inequality and competing interest affects student academic performance (Naveed, 2021). Valente, Lourenco and Nemet (2020) identified causes that generate conflict, and not only concerning the expectations of the teacher-student but also the student towards the teacher. The authors highlighted the problems that cause conflict: Discipline problems, the attitudes of undisciplined student which may lead to conflicts that distract the attention of instructors in the school; these are the result of provocation and disobedience of the student towards the teacher or the teacher on the student to exercise their authority. Conflicts in school between teachers affect the quality of teaching and learning, teacher's performance, community concern and indirectly the student performance (Thapa, 2015). Effective leadership in the administration of School helped to enhance academic performance of student (Akpan, Okey and Esirah, 2016). Leadership is a process of influencing the activities of a group of people by a leader in efforts towards goal achievement (Mouton, 2021). Leadership is the ability to get things done with the assistance and co-operation of other people within the school system (Murphy, 2014). The current study anchored the theory, because correspondence theory identifies that the structure of schools mirrors the structure of workplace. The school system and the workplace are deigned in such a way that conflict manifest, this can positively or negatively have impact on student academic performance.

Methodology

Descriptive survey research design was employed through and structured questionnaire was used as instrument for data collection. The design enabled the researcher to get information on causes of School-based conflict, types of school conflict, effect of school-based conflict on the academic performance of students, and the strategies used for resolving conflict

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related issues. This study comprised of 12,736 senior secondary II (SS2) students of which 7,606 are males with 4,719 females. These figures were drawn from four (4) Local Government Areas (Bungudu, Gusau, Maru and Tsafe) of Zamfara State Central Senatorial Zone. A proportionate sampling procedure was adopted to select the sample size of 378 students among the group of the respondents (male and females), a purposive sampling technique was used to select 20 Senior Secondary Schools out of the 80, which are in the central senatorial zone of Zamfara State. Simple random sampling technique (by balloting) was used to select 243 males and 135 female students (Bungudu 69, Gusau 206, Maru 41 and Tsafe 62), who were selected based on their schools which makes the total of 378 respondents that comprise the sampled size of the study. The instrument was validated by experts in the Department of Education. The result of the pilot study was statistically analysed for reliability using Cronbach Alpha co-efficient (r) and the reliability co-efficient of 0.864 was obtained. A letter of introduction was collected by the researcher from the Head, Department of Education to Zamfara State Ministry of Education Science and Technology (ZMOEST) to seek permission and approval to visit the selected schools. The researcher and research assistant administer the instruments and the instruments were completed and retrieved. The data collected was analysed using descriptive and inferential statistics. Mean and standard deviation were used to answer the research questions, while all the hypotheses were tested using the one-sample t-test.

Table 1: Population of the Study

S/No	LGEA	No. of Schools	No. of Students		
			Males	Females	TOTAL
1.	Bungudu	19	1,393	860	2,253
2.	Gusau	31	3,746	2,978	6,724
3.	Maru	12	913	406	1,319
4.	Tsafe	18	1,554	475	2,029
Total		**80**	**7,606**	**4,719**	**12,325**

Source: Zamfara State Ministry of Education Science and Technology (ZSMOEST), 2024.

Table 2: Sample size Distribution Table

S/N	LGAS	SCHOOLS	Males	Females	Total
1.	**Bungudu**	5	24	45	69
2.	**Gusau**	5	152	54	206
3.	**Maru**	5	20	21	41
4.	**Tsafe**	5	47	15	62
Total		**20**	**243**	**135**	**378**

Source: Fieldwork (2025)

Presentation of Results

Table 3: One-sample t-test on the Relationship between School-based Conflict and Academic Performance of Senior Secondary School Students in central senatorial zone of Zamfara State Nigeria

	Test Value = 3.64							
Category	**T**	**N**	**M**	**Df**	**Sig.**	**Mean Difference**	**95% Confidence Interval of Difference**	
							Lower	**Upper**
Relationship between SBC and Academic Performance	137.916	378	3.64	377	0.05	3.639	3.5873	3.6910

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Source: Fieldwork (2025)

The result in table 3 above reveals that there is significant difference on the relationship between school-based conflict and academic performance of senior secondary school students in central senatorial zone of Zamfara State, Nigeria. The mean score of 3.64 for the group of respondents was obtained, calculated at 2.50 with p-value of 0.05.

Table 4: One-sample t-test on the Roles of School Administrators, Teachers and Counselors in Managing and Resolving School-based Conflict in Senior Secondary Schools in central senatorial zone of Zamfara State, Nigeria

	Test Value = 3.50							
Category	**T**	**N**	**M**	**Df**	**Sig.**	**Mean Difference**	**95% Confidence Interval of Difference**	
							Lower	**Upper**
Role of School Admin., Teachers and Counselors	141.782	378	3.50	377	0.05	3.503	3.6166	3.7183

Source: Fieldwork (2025)

The result of one-sample t-test in table 12 above reveals that there is significant difference on the roles of administrators, teachers and counselors in managing and resolving school-based conflict in senior secondary schools in central senatorial zone of Zamfara State, Nigeria. Mean score of 3.50 for the group of respondents was obtained, calculated of 2.50 and p-value at a 0.05 level of significance was obtained.

Discussions of Findings

The discussion is based on the variables contained in the study which are guided by the research questions and research hypothesis tested. The first finding of the study was on the effect of school-based conflict on academic performance of senior secondary school students. Hypothesis one (1) was used to find out whether there is significant difference on the relationship between school-based conflict and academic performance of senior secondary school students in central senatorial zone of Zamfara State, Nigeria. The responses of the respondents revealed that majority of the respondents agreed with the relationship between school-based conflict and academic performance of senior secondary school students. The mean score of 3.64 was obtained with standard deviation of 0.56 which is greater than critical value of 2.50 as indicated in hypothesis two. This finding is in line with the statement made by Goksoy and Argon (2016), who said that conflict affect academic performance of students and work performance of the school personnel's. Conflict is considered having an impact on academic performance of students if it leads to breakdown in communication, tension, argument and low attendance to school (Eze and Victor 2022).

Hypothesis two (2) was used in the study to find out whether there is significant difference on the roles of administrators, teachers and counselors in managing and resolving school-based conflict in senior secondary schools in central senatorial zone of Zamfara State, Nigeria. The study reveals that there is significant difference on the roles of administrators, teachers and counselors in managing and resolving school-based conflict in senior secondary schools in central senatorial zone of Zamfara State, Nigeria. Calculated value of 3.50 was obtained as indicated in hypothesis three which is higher than decision mean of 2.50 of the study. The findings are in agreement with the statement of Onyango (2020), who stated that conflict is not the problem it is when conflict is poorly managed that is what makes it to be problem. The way educators and students understand the nature of conflict, the better they can manage conflicts constructively. Ghafar (2019) stated that the effectiveness of a conflict resolution and peer mediation programme may be limited when the classroom and school context is competitive. Catana (2015), state that involvement of teachers in decision making is very crucial in the administrative process, they played an important role in providing solutions to issues that may affect the academic performance of students. However, Alex and Makadi (2022), states that conflict resolution strategies have positive impact on the effective management by ensuring peace and harmony, high job performance, high academic performance, the spirit of teamwork, high retention of teachers and problem-solving.

Conclusion

Based on the results of the findings the study concluded that conflict occur in most of the senior secondary schools in central senatorial zone of Zamfara State, Nigeria. The study revealed that there is concrete relationship between student academic performance and school-based conflict as indicated in table 3 of the study that 3.64% equivalent to 95% of conflict the occur in school affect student academic performance in senior secondary schools in the central senatorial zone of Zamfara State, Nigeria. The study also concluded that school administrators, teachers and counselors play an important role in managing and resolving school-based conflict in senior secondary schools in central senatorial zone of Zamfara State, Nigeria. This is based on the result of the study that indicate 3.50% equivalent to 95% of the administrators, counsellors and teachers help in managing and resolving conflict in senior secondary schools as shown in table 4 of the study.

Recommendations

1. Administrators, teachers, counselors and students should develop strategies for investigating the effect of school-based conflict on academic performance of senior secondary school, since the result of the study indicated that conflict that arise in school affect the academic performance of senior secondary school students.
2. Stakeholders should ensure the provision and proper utilization of guidance and counseling unit in the school so that conflict related problems will be managed and resolved in a systematic way.
3. Students should seek support and guidance from teachers, counselors, mediators and parents in managing and resolving conflict related issues in school.
4. The government through the state ministry of education and education boards should organize from time to time workshop and seminars for teachers and school administrators on how to manage and resolve conflict that may occur in the school.
5. Conflict resolution strategies should be given more consideration by the school administrators in the process of planning and implementation of school policies, so that school will achieve its desired objective.

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Assessment of Donkey Meat (*Equus asinus*) Consumption among Households in Delta North Senatorial District of Delta State, Nigeria

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Abstract
The donkey is a domestic animal commonly found around homes in Nigeria. Despite its nutritional benefits, household consumption of donkey meat in Nigeria remains low. This study was conducted to determine the household consumption of donkey meat (Equus asinus) in the Delta North Senatorial District, Delta State, Nigeria. Three objectives were established to guide the study and two hypotheses were raised and tested at 0.5 level of significant. A descriptive survey research design was employed. The population consisted of 1,695,200 households in the Delta North Senatorial District, and a sample size of 400 was obtained using a multistage sampling technique. The questionnaire titled Household Consumption of Donkey Meat Questionnaire (HCDMQ) was used as the data collection instrument. Findings revealed that the level of household consumption of donkey meat in Delta State was high. Barriers to consumption included cultural barriers, negative perceptions or beliefs, poor awareness, religious restrictions, high cost, and low food safety. Strategies suggested to improve donkey meat consumption in the district includes but not limited to providing discounts and sample tastings, utilizing social media and e-commerce platforms to reach wider consumers, educating households on the nutritional benefits of donkey meat, and improving its accessibility. Therefore, this study concludes that although households in the study area frequently consume donkey meat, barriers to its consumption still exist. It is recommended that public education and awareness campaigns be conducted to highlight the nutritional benefits of donkey meat.
Keywords: *Household consumption, Donkey Meat, Food and Nutrition, Nutritional content.*

Introduction
Household consumption refers to the use or purchase of goods and services by a family to meet their personal needs and desires (Yonas, 2024). In this context, the household consumption of donkey meat involves the regular or occasional intake of donkey meat by individuals within a household to satisfy their dietary needs. Donkeys, domesticated animals commonly found in Nigerian households, belong to the Equidae family and are closely related to horses and zebras. Donkey meat, derived from *Equus asinus*, is consumed in various parts of the world, including regions in Asia, Africa, parts of Europe, and Nigeria (Hassan et al., 2022). The consumption of donkey meat is influenced by factors such as geographic location, religious beliefs, cultural practices, economic conditions, and individual preferences. In some cases, it is prepared and eaten as part of traditional cuisine (Ogba, 2014). Donkey meat, often used as a substitute for beef or pork, is a type of red meat characterized by its higher myoglobin content. Myoglobin is a muscle protein responsible for storing and transporting oxygen to muscle cells, which contributes to the meat's reddish colour (Vanek & Kohli, 2025). Compared to beef and pork, donkey meat is leaner and contains significantly less fat. According to Ivanković et al. (2023), "donkey meat is low in fat, cholesterol, and has a favourable fatty acid profile. It is also rich in iron, crude protein, and essential minerals, these nutritional qualities have led the authors to recommend donkey meat for consumption due to its minimal levels of fat, cholesterol, and fatty acids'' Furthermore, studies by Ivanković et al. (2023) and Hassan et al. (2022) reveal that 100 grams of donkey meat contains only 2.02 grams of fat considerably lower than the fat content found in beef (7.9 g/100 g), lamb (8.1 g/100 g), and pork (8.2 g/100 g). Its cholesterol content is also lower at 66.7 mg per 100 grams, compared to beef (73.1 mg), lamb (78.2 mg), and pork (73.2 mg). As a result, donkey meat stands out as a healthy and nutritionally appealing alternative to more commonly consumed red meats (Polidori et al., 2020). Despite its nutritional benefits, the consumption

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of donkey meat remains limited. For example, Ogba (2014) reported that in many areas of Ebonyi State, people reject donkey meat due to cultural perceptions seeing the animal primarily as a beast of burden used for transporting goods, carrying the deceased, and transporting the sick or disabled in Northern Nigeria. Additionally, Zhang et al. (2024) observed that several factors including breed, genetics, sex, age, muscle type, feeding practices, storage, and processing methods—significantly influence the nutritional quality of donkey meat, which subsequently affects its acceptance and consumption. While donkey meat is not as widely accepted as beef or chicken, it is still consumed by specific individuals and communities. Omonigho, (2018) observed that in Central and South Senatorial Districts of Delta State, it is commonly enjoyed in restaurants, often accompanied by chilled alcoholic beverages. In these areas, households frequently purchase it in its dried form, known as *tilk*. The sale of donkey meat, particularly when dried, is a profitable and thriving business in these regions. However, there is currently no available data on the level of donkey meat consumption in the Delta North Senatorial District, which has prompted this study. Several factors can influence the consumption of donkey meat. Predanócyová et al. (2023), in a study conducted in Slovakia, found that gender plays a role in the consumption of meat and meat products, with men generally consuming more meat than women. Similarly, a Swedish study by Jovanovic and Navickiene (2016) supported this finding. In the United States, Ritzel and Mann (2021) reported that women tend to be more concerned about the calorie content and healthiness of their meals, while men are more focused on taste and enjoyment. This trend is partly attributed to the perception that eating meat is masculine, whereas consuming fruits and vegetables is seen as more feminine (Velzeboer et al., 2024). Daniel and Tomiyama (2021) further observed that eating meat, including donkey meat, is often associated with masculinity, with some men viewing it as a way to affirm their manhood. Location is another key factor influencing donkey meat consumption. According to Hassan et al. (2013), access to donkey meat differs between rural and urban areas, with consumption being more common in rural regions. This is largely due to the greater availability of donkeys for slaughter and their widespread use as working animals in rural communities (Pogurschi et al., 2018). Exploring household consumption of donkey meat offers valuable insights into local dietary habits, cultural taboos, and food preferences factors that are crucial for developing culturally appropriate policies. As a potential alternative source of protein, donkey meat could play a role in enhancing nutritional security. However, the scarcity of academic research on donkey meat consumption in the study area makes it difficult to evaluate its dietary significance and its impact on the health of local populations. This study aims to address this gap by generating data that can inform future research and policy development. Consequently, the objective of this research is to determine the extent of household consumption of donkey meat in the Delta North Senatorial District of Delta State.

Research questions

1. What are the levels of household consumption of donkey meat in the Delta North Senatorial District?
2. What are the barriers to donkey meat consumption in the Delta North Senatorial District?
3. What are the strategies for improving the consumption of Donkey Meat in the Delta North Senatorial District

Hypotheses

The following will be tested at 0.05 level of significance.

H_{o1}: There are significant differences in the consumption of donkey meat between genders, with males consuming more than females.

H_{o2}: The consumption of donkey meat varies significantly by geographic location, with rural households consuming more than urban households due to nutritional awareness availability.

Methodology

The study employed a descriptive survey research design. According to Nworgu (2015), survey research is used to systematically collect data and describe characteristics such as attitudes, activities, motivations, and opinions within a given population. The target population for this study consisted of 1,695,200 households in the Delta North Senatorial District of Delta State (Delta State Population Statistics, 2022). The sample size was determined using a multistage sampling technique. The first stage involved using Taro Yamane's formula to obtain the sample size of four hundred (400) respondents for the study. Where n = N 1 + N (e) 2. Sample size N = Population size (i.e., 1,695,200) e = Sampling error estimation (i.e., 5%) 1 = Constant value. This calculation yielded a sample size of 390 households. The second stage involved the simple random selection of two local government areas (Ika South and Ika North East) to represent the Delta North Senatorial District. In the final stage, the sample size was evenly distributed among the two selected local government

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areas, resulting in 200 respondents from each area. The sample size consists of 400 respondents. The researcher developed an instrument called the Household Consumption of Donkey Meat Questionnaire (HCDMQ). The HCDMQ has a total of thirty-one items. The questionnaire was segmented into four sections. Section A obtained data about the respondents' gender and area of residence. Section B contained 11 items that elicited data on the level of consumption of donkey meat. Section C, comprising 11 items, obtained information on the barriers to donkey meat consumption. The 9-item section C elicited data on the strategies for improving the consumption of donkey meat in households. Responses were on a 4-point scale of strongly agree (SA=4), agree (A=3), disagree (D=2), and strongly disagree (SD=1). The reliability of the instrument was assessed using a sample of 20 respondents drawn from the study population. Cronbach's Alpha was employed to determine the internal consistency of the instrument, yielding a coefficient value of 0.72. Based on this result, the instrument was considered reliable. All procedures in the study adhered to ethical guidelines for research involving human participants, ensuring respect for individuals, confidentiality, and participant safety. Oral informed consent was voluntarily obtained from each participant prior to their involvement in the study. The researcher, assisted by four trained research assistants, administered the questionnaire directly to the respondents. The questionnaires were completed and collected on the spot, resulting in a 100% response rate. The data collected were analysed using the Statistical Package for Social Sciences (SPSS), version 23. Descriptive statistics such as mean and standard deviation were used to summarize the data. Items with a mean score of 2.50 or higher were interpreted as "Agreed," while items with a mean score below 2.50 were considered "Disagreed." Inferential statistics, specifically the independent samples t-test, were used to test the stated hypotheses at the 0.05 level of significance. A hypothesis was rejected if the p-value was less than the critical value (0.05); otherwise, it was retained.

Presentation of Results

1. **Research Question One:** What are the levels of household consumption of donkey meat in the Delta North Senatorial District?

Table 1: Levels of household consumption of donkey meat

Levels	Mean	Standard Deviation	Decision
I eat donkey meat out of curiosity or experiment	2.07	1.042	Disagree
I purchase donkey meat for household consumption	3.43	.774	Agree
I eat donkey meat due to its taste or flavor	3.36	.720	Agree
I consume donkey meat when I visit rural areas	3.36	1.107	Agree
I deliberately look for a place that sells donkey meat	3.04	.820	Agree
I consume donkey meat because it is tender	3.51	1.30	Agree
I eat donkey meat based on its health or nutritional benefits	3.27	1.33	Agree
I prefer donkey meat over other red meats	3.36	.820	Agree
I consume donkey meat once a week or more	3.10	.980	Agree
I consume donkey meat as part of my regular diet	3.18	.888	Agree
I eat donkey meat at restaurants or eateries	2.72	.995	Agree

Table 1 shows the level of donkey meat consumption of households in Delta North Senatorial District, Delta State. Out of the 11 mentioned items, 10 were greater than the cut-off points of 2.50 on a 4-point rating scale. I consume donkey meat because it is tender (3.36), I eat donkey meat due to its taste or flavor (3.36)**,** I purchase donkey meat for household consumption (3.43), and I consume donkey meat as part of my regular diet (3.18**).** The respondents showed a low extent of eating donkey meat out of curiosity (2.07), below the benchmark of 2.50 on a 4-point scale. This implies that the level of household consumption is high due to its taste, flavour, tenderness, nutritional value, preference over red meat, sold in the eateries as regular meat.

2. **Research Question Two:** What are the barriers to donkey meat consumption in the Delta North Senatorial District?

Table 2: Barriers to donkey meat consumption

Barriers	Mean	Standard Deviation	Decision
Some cultures consider donkey meat unclean and forbid eating it	2.83	1.16	Agree
Negative belief about donkey meat	2.93	1.06	Agree

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Poor awareness about the nutritional benefits of donkey meat	2.68	1.14	Agree
Donkeys are used to carry dead people	2.96	.96	Agree
Some religion forbids eating donkey meat	2.92	1.26	Agree
Donkey meat is not as tasty as other red meats	2.51	1.30	Agree
Donkey meat is not readily available in local markets	2.27	1.13	Disagree
High cost of donkey meat	2.91	1.21	Agree
The perception that a donkey is a burden beast	3.08	1.12	Agree
Consumers of donkey meat are seen as outcasts	2.45	1.10	Disagree
Low food safety standards during the processing of donkey meat	2.53	1.27	Agree

Table 2 revealed the mean and standard deviation responses of the respondents on barriers to donkey meat consumption. Out of the 11 mentioned items, 9 were greater than the cut-off points of 2.50 on a 4-point rating scale. This includes the perception that a donkey is a burden beast (3.08), donkeys are used to carry dead people (2.96), negative beliefs about donkey meat (2.93), some religion forbids eating donkey meat (2.92), the high cost of donkey meat (2.91), among others. Donkey meat not being readily available in local markets, with a mean of 2.27, and consumers being seen as outcasts (2.45) were not considered barriers to the consumption of donkey meat by the respondents. This implies that barriers like culture, negative perception or beliefs, poor awareness, religion, high cost, and low food safety hamper the consumption of donkey meat in the Delta North Senatorial District.

3. **Research Question Three:** What are the strategies for improving the consumption of Donkey Meat in the Delta North Senatorial District

Table 3: Strategies for improving the consumption of Donkey

Strategies	Mean	Standard Deviation	Decision
Promotion of donkey meat in culturally acceptable areas	2.31	1.10	Disagree
Donkey meat should be made affordable	2.40	1.08	Disagree
Households should be educated on the nutritional benefits of donkey meat	2.57	1.23	Agree
Use of social media and e-commerce platforms to create awareness about donkeys	2.75	1.09	Agree
Explore new marketing channels to reach more consumers	2.73	1.21	Agree
Improve transportation networks to make donkey meat more accessible to consumers	2.50	1.26	Agree
Promoting donkey meat in local cuisine	2.72	1.20	Agree
Improve slaughtering and processing facilities to ensure meat quality and safety	2.62	1.27	Agree
The use of discounts and sample tastings to improve interest	3.00	1.09	Agree

Table 3 revealed the mean and standard deviation responses of the respondents on strategies for improving the consumption of donkey meat. Out of the 9 mentioned items, 7 had a mean ranging from 2.50 to 3.00, which were greater than the cut-off points of 2.50 on a 4-point rating scale, with a standard deviation ranging from 1.08 to 1.27. Some of these strategies include providing discounts and sample tastings (3.00), utilizing social media and e-commerce platforms to reach wider consumers (2.75), educating households on the nutritional benefits of donkey meat (2.75), and promoting donkey meat in local cuisine (2.72). Promotion of donkey meat in areas where they are culturally acceptable (2.31) and making donkey meat affordable (2.40) were not seen as strategies for improving the consumption of donkey meat by the respondents.

H_{o1}: There are significant differences in the consumption of donkey meat between genders, with males consuming more than females.

Table 5: T-test analysis of the difference in the consumption of donkey meat based on gender

Gender	N	Mean ($\bar{X}$)	SD	Df	t-cal.	P-value	Decision
Male	188	59.85	9.372	398	2.709	.007	Rejected
Female	212	57.51	7.702				

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Table 5 presents a t-value of 2.709 and a p-value of 0.007 for the difference in donkey meat consumption based on gender. At an alpha level of 0.05, the p-value is less than the significance level, indicating a statistically significant difference. Therefore, the null hypothesis which stated that there is no significant difference in donkey meat consumption based on gender is rejected. This implies that males and females do not consume donkey meat equally. With a mean difference of 2.35, the results suggest that males consume donkey meat more than females. This disparity may be attributed to gender roles and cultural expectations. Men are often more likely to consume certain types of meat, including donkey meat, due to traditional associations with strength, hunting, or specific food preferences. In contrast, women may adhere to different dietary habits, customs, or restrictions.

H_{o2}: The consumption of donkey meat varies significantly by geographic location, with rural households consuming more than urban households due to nutritional awareness availability.

Table 6: T-test analysis of the consumption of donkey meat based on geographical location

Location	N	Mean ($\bar{X}$)	SD	Df	t-value	P-value	Decision
Rural	184	57.63	8.185	398	-2.126	.034	8.866
Urban	216	59.44					

Table 6 shows a t-value of -2.126 and a p-value of 0.035. At an alpha level of 0.05, the p-value is less than the significance level, indicating a statistically significant difference. Therefore, the null hypothesis that there is no significant difference in donkey meat consumption based on location is rejected. This suggests that rural and urban residents in the Delta North Senatorial District consume donkey meat at different rates. With a mean difference of 1.81, the results indicate that urban consumers consume donkey meat more than rural residents. This difference may be due to varying cultural attitudes toward donkey meat in urban areas, which could be influenced by globalization, media exposure, and cultural exchange. In contrast, rural communities may adhere more closely to traditional dietary practices, resulting in lower consumption.

Discussion of findings

The study investigated household consumption of donkey meat (*Equus asinus*) in the Delta North Senatorial District. Conducting research on this topic is justified for several reasons. It provides insight into local consumption patterns, cultural beliefs, economic factors, public health concerns, and conservation issues. Such information is essential for policymakers, public health officials, livestock managers, and local communities alike. The findings revealed that respondents generally agreed that the level of household consumption of donkey meat in the Delta North Senatorial District was high. This highlights the importance of donkey meat in local dietary practices and suggests potential economic, health, and regulatory implications. Authorities and stakeholders should consider these findings when making decisions related to food safety, nutrition policies, and cultural sensitivities. This finding is in line with Li et al. (2017) who confirmed that donkey meat is regarded as a traditional delicacy and is widely consumed in China, Italy, and certain regions of Africa. In China, donkey meat is especially popular in specific culinary dishes and is valued both for its nutritional benefits and cultural significance. This finding aligns with Ogba (2014), who noted that many people in both rural and urban areas of Ebonyi State accept and consume donkey meat. It also supports the observations of Polidori et al. (2020), who described donkey meat as a healthy and nutritionally valuable alternative to other common types of red meat. Further findings revealed that several barriers limit the consumption of donkey meat in the Delta North Senatorial District. These include cultural restrictions, negative consumer perceptions and beliefs, lack of awareness, religious prohibitions, high cost, and concerns about food safety. These barriers present significant challenges that must be addressed to encourage greater acceptance and regular consumption of donkey meat in the area. This finding is in line with Ogba's (2014) assertion that culture, religion, taste, colour, availability, and cost are major reasons why donkey meat is rejected in many parts of Ebonyi State. He attributes the barriers and low consumption of donkey meat to the role's donkeys perform in Northern Nigeria, such as transporting goods, carrying the dead, and assisting the sick and disabled. Donkeys are often viewed as burden animals with little or no nutritional value. This finding contrasts with Zhang et al. (2024), who identified factors affecting the quality and nutritional value of donkey meat to include breed, genetics, gender, age, muscle type, feeding regimen, storage, and processing conditions. The study also identified strategies to enhance donkey meat consumption in the Delta North Senatorial District. These strategies include offering discounts and sample tastings, leveraging social media and e-commerce platforms to reach a broader audience, educating households about the nutritional benefits of donkey meat,

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exploring new marketing channels, improving meat accessibility, conducting public awareness campaigns, enhancing the safety of slaughtering and processing facilities, and promoting donkey meat in local cuisine. These findings suggest that adopting modern marketing approaches such as discounts, tastings, and digital platforms can effectively raise awareness and boost consumption of donkey meat in the district. These methods will help attract new customers, make donkey meat easier to get, and reach more people especially younger or tech-savvy consumers. By using these strategies, demand for donkey meat could increase, support local farmers, and help the donkey meat industry grow in the community. This agrees with Ogba (2014), who said that educating people can improve the acceptance and use of donkey meat. The findings also showed a clear difference between men and women in donkey meat consumption, with men eating it more than women. This suggests that cultural, social, or belief-related barriers might limit women from eating donkey meat. To encourage equal consumption, there should be education and awareness programs to address any misunderstandings or cultural rules that stop women from eating donkey meat. Marketing could also be designed to appeal more to women, creating new opportunities and helping the industry grow in a more inclusive way. This finding supports Jovanovic and Navickiene (2016), who found that men eat more meat than women. They also noted that women pay more attention to health and calories, while men care more about the taste and enjoyment of food. Similarly, Velzeboer et al. (2024) observed that women eat more fruits and vegetables than men, and they suggested that eating meat is seen as masculine, while eating fruits and vegetables is viewed as feminine. Daniel and Tomiyama (2021) also found that men tend to eat more meat and are less likely to become vegetarian compared to women. Predanócyová et al. (2023) agreed, showing that men generally consume more meat and meat products than women. This may be because meat, being high in protein and energy, is linked to ideas of strength and power. Ritzel and Mann (2021) also supported these findings by concluding that men eat more meat than women. The findings show that there is a significant difference in donkey meat consumption based on location. Urban consumers eat more donkey meat than those in rural areas. This higher consumption in cities may be because urban people have better access to donkey meat through markets and restaurants, higher incomes, or different cultural attitudes. This suggests that marketing and sales efforts should first focus on urban areas, while efforts to raise awareness and improve access in rural areas could also help increase consumption there. This finding aligns with Betru and Kawashima (2009), who discovered that urbanization and higher income levels are associated with increased meat consumption in Ethiopia. The findings also support Aganga et al. (2003), who reported that men and women differ significantly in their views on donkey meat's consumption, tenderness, and firmness. However, these results contrast with Pogurschi et al. (2018), who said donkey meat is more commonly eaten in rural areas because donkeys are more available for slaughter there.

Conclusion

The major conclusion reached from the findings is that household consumption of donkey meat in the Delta North Senatorial District is high because of its taste, flavuor, and nutritional benefits. However, barriers like cultural beliefs, negative opinions, lack of awareness, religious restrictions, high cost, and concerns about food safety limit its consumption. To increase consumption, social media and online platforms can be used to reach more people. Educating households about the health benefits of donkey meat, running public awareness campaigns, and promoting it in local dishes are also important. The study found that donkey meat consumption varies by gender and location, with more men than women eating it.

Recommendations

Based on the findings of the research, the following recommendations were made.

1. The government and key groups should strengthen rules for the donkey meat supply chain, promote public health education about safe ways to eat donkey meat, and support sustainable donkey farming.
2. Government agencies, NGOs, and community leaders should run awareness and education programs, enforce food safety rules, help lower the cost of donkey meat production, and encourage respectful conversations about cultural and religious beliefs. These actions will build trust and clear up misunderstandings while respecting different cultures and religions.
3. Stakeholders should create promotional campaigns, use digital platforms for marketing and sales, provide nutrition education, find new ways to sell donkey meat, and improve how easy and safe it is to get. Adding donkey meat to local recipes and increasing public awareness will also help boost acceptance and demand.

4. Awareness and nutrition education programs should focus on the concerns and views of women. Encouraging women to take part in the donkey meat business, creating recipes that appeal to them, and addressing cultural or religious beliefs can help close the consumption gap and increase acceptance in households.

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Effect of Behaviour Activation Counselling Technique on Job Stress among Female Teachers in Post Basic Schools in Kano Municipal Zonal Education Directorate

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Abstract

Job stress remains a pervasive occupational threat, particularly withing the teaching profession, where female teachers in Nigeria's post basic schools face compounded pressures from excessive workloads, inadequate resources, administrative demands and family responsibilities. This research investigated the effects of Behaviour Activation Counselling Technique on job stress among female teachers in post basic schools in Kano Municipal Zonal Education Directorate. The main objective of the study is to assess the effects of both Behaviour Activation Counselling Technique on social, emotional and time management dimensions of job stress. Three research questions with corresponding null hypotheses were raised and tested. It was a pre-test post-tests design in form of quasi-experimental design. Population of the study consist of one hundred and nine (109) female teachers identified with job stress. After the identification, one school with highest number of identified female teachers with job stress symptoms was selected, making a sample of 15 female teachers. Two data collection instruments were used for the study; Validated Job Stress Checklist which was used for identification with a reliability index of 0.813, indicating a high degree of stability and making the Job Stress Checklist (JSC) a suitable tool for research in the study area. The second instrument was validated Job Stress Questionnaire (JSQ) and its reliability of 0.807 was obtained. Parametric statistics specifically paired sample t-test and t-test for independent samples were used in arriving at conclusions. Paired sample t-test was used to compare the pre-test and post-test results. The hypotheses of the study were tested at 0.05 level of significance. The study contributes empirical evidence to job stress management literature and offers practical implications for counsellors, researchers, educational administrators, and policy-makers in designing evidence -based programmes to enhance teacher resilience, job satisfaction and educational quality. findings of the study indicate a significant effect of Behaviour Activation Counselling Technique on social, emotional and time management dimensions of Job Stress among Female Teachers in Post Basic Schools in Kano Municipal Zonal Education Directorate. The study recommends the use of Behaviour Activation counselling techniques in addressing job stress of female teachers.

Keywords: Behaviour activation counselling technique, Job Stress, Female Teachers

INTRODUCTION

Job stress is a global issue, it signifies physical, emotional and psychological tension resulting from job-related demands. Teaching job is one of the most stressful professions due to its high demands and pressure to meet the expectations. Teaching is increasingly stressful job particularly for women teachers facing multiple societal and professional pressures. Job Stress negatively impacts teacher's mental and physical, emotional and psychological well-being, affecting job performance and student outcomes. In Nigeria, numerous studies revealed that female teachers in post basic schools experience stress from different angles including excessive workload, poor working conditions, lack or insufficient instructional materials and poor organisational support. Therefore, the major stressors in teaching job include excessive workloads, student behaviours and inadequate support. On the other hand, Female teachers frequently face additional stressors in addition to that of their profession, because they are battling with family responsibilities and their job demands, complicating their ability to cope with stress. Within post-basic schools, teachers face multiple stressors including heavy workload, large class sizes, administrative pressure, student indiscipline, limited teaching resources, curriculum overload

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and the constant demand to meet performance benchmarks. Female teachers, however, often navigate additional layers of stress arising from societal expectations, gender roles, work-family balance challenges and in some cases, workplace discrimination or limited opportunities for advancement. The formal office work is increasingly characterised by job stress, which do not only affect employee's professional life, but their overall well-being, Job stress s instigated by an incompatibility between workloads and individual capacities to deal with such loads. This is because enormous volume of work and long working hours generates work life imbalance and increase the stress level of employees. Job stress reduces employee's performance, divert their attention and cause lack of motivation for their total growth and development. Some stressful conditions could be positive and certain degree of stress can also be useful from time to time in order to stay alert and attentive. This is because it motivates an employee to perform better. Recurrent interaction with stressful conditions can also have a negative effect on both physical and mental health of such employee, which could be harmful, both personally and professionally. Job stress can upset an individual's family life, the relationship at work and life situation in general. It has significant effects on the performance of employees and organisations. Employee's health is also affected by stress in various ways. Stress can take place when there is inconsistency between the requests of the working environment and a person's competence to complete the demands. Job related stress is a universal problem and inimical to productivity, while the most predominant risk factor was increased workload followed by shortage of resources.

Job stress encompasses a complex interplay of physical, social, behavioral, emotional, cognitive and organisational dimensions. There are also relationships between time management and organisational efficiency. Stress at work usually have negative effects on the performance of individual and each stress level decreases work performance by exhausting strength, devotion, while time of individual physical changes occur as a result of stressors which harm performance Mata et al, (2021). Research on job stress among female teachers in post-basic education schools is critical because female teachers are frequently exposed to high levels of job stress arising from heavy workloads, administrative demands, limited resources and the challenge of balancing job responsibilities with personal and family roles. This can negatively affect their social, psychological and mental health, as well as their emotional well-being, job satisfaction, and teaching effectiveness. Prolonged job stress may lead to burnout, anxiety, reduced productivity, increase absenteeism and attrition, thereby undermining educational quality and student outcomes. To address the challenges related to job stress effectively among female teachers in post basic schools in Kano Municipal Zonal Education Directorate, Behaviour Activation counseling technique was employed. Behaviour activation (BA) is a counselling technique used in Cognitive Behaviour Therapy (CBT) to help individuals overcome depression and other mood disorders. It helps in combating inactive and helps individual to become more active. It includes identifying avoidance behaviours, setting meaningful goals, planning activities and monitoring mood. It is a technique to mental health that involve individuals using activities to influence their expressive state.

Behaviour Activation (BA) encourages people to engage in anti-depressant behaviours. It is based on behaviourism which is a branch of psychology that focuses on how people's environment shapes their actions, emotions and entire mental health. It is used to help individual to stay practice and focused and by deliberately practicing certain behaviours, people can initiate a helpful positive and encouraging emotional state. Behaviour Activation (BA) is design to help individuals to have control over their lives and develop positive expertise. Job is principally a social endeavour and therefore a number of stressful experiences at job are social in nature. Social stressors are challenges and pressures individuals experience in occupations that involve significant interpersonal interactions. Social stressors are behaviours and situations that are related to physical and psychological pressures. It also includes aggression, rudeness, insulting supervision, unjust treatment, organisational politics, verbal aggression from subordinate or tyrannical conducts of superiors, poor social interactions with direct supervisors which may also emanate from conditions at work, emotional demands, communication gap difficulties, conflicts and high expectations. Social workers have been recognised as being at risk of experiencing stress and burnout, being involved in complex social situations which greatly lead to experiencing many of the conflicts that are obvious in human service work. Studies consistently indicated burnout to be injurious to individuals in the field of social work, in which devastating outcome could occur, which also wedged turnover intent, occupational functioning and organisational commitment (Powell & Mayfield, 2024). Societal and political changes have impacted on the role of workers and the responsibilities they are expected to assume. Employees who feel stressful may detect a deteriorating of

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relationships and social support, while those employees who feel lack of support may likely not experience job engagement. Time management is highly related to job stress, being a procedure in which individuals organise their schedules to carry out tasks or activities within a specific limit of time. Even though, time is the most significant resource which every individual has in equality. A number of individuals fail in utilising their time appropriately due to lack of time management techniques, which reduces high level of stress. Proper and proficient utilisation of time management skills by individual workers could easily mitigate the level of stress, resulting in less stress at work with improve performance and productivity. Workers in Nigeria generally suffered greatly due to meagre remunerations, incessant inflation and general economic hardship and women were left with a great portion of their family's financial responsibilities, teachers inclusive. The fact that these issues are amassed and not abetting and they lead to enormous social, physical, emotional, psychological and medical problems informs the need to address the issue of job stress among female teachers of post basic schools in Kano Municipal Zonal Education Directorate. This is with a view to easing their tension and support them to cope with job stress efficiently, in order to have peaceful mind and healthy body capable of producing productive citizens that will contribute greatly to nation building and humanity at large. Post basic stage is the later stage of secondary education, where most of the students are teenagers or at their adolescence stage, being the most problematic stage during which they prepare for life into adulthood. It is a stage of preparation for higher education or vocational training, when the curriculum is specialised and focused on subjects based on interest and future career goals at the end of the programme. Teachers in this kind of situation needs to work in an environment that promote respect, fairness and continuous professional growth and development. The environment that promotes mentoring, training and work life balance with policies that recognise the diverse responsibilities they may have outside their working environment. A place with flexible working arrangement that promote and contribute to a healthier work life balance and help the teachers to enhance their skills and contribute effectively to teaching and learning. In view of this, it is important to note that post basic studies are considered to be very important educational stage, due to its significance as the bridge linking the lower basic and tertiary or advance level. For effective teaching and learning to take place there is need for conducive atmosphere for learning and competent professional and stress-free teachers inclusive. It is against this background this research investigated the effect of Behaviour Activation Counselling Technique on Job stress of female teachers in Post Basic Schools in Kano Municipal Zonal Education Directorate. Female teachers in Nigeria are facing numerous challenges, leading to job stress which include excessive work load and responsibilities, professional responsibilities, inadequate educational facilities and other needed infrastructure, limited and insufficient access to opportunities for professional growth and development. Balancing professional responsibilities with personal and family commitments is another challenge for Nigerian female teachers, which indicates great need for useful and practical interventions that could reduce stress and enhance the job performance. The need to address the work life balance and work overload to find out the techniques that will address the female teacher's stress, is to create supportive and conducive working environment that will improve the overall educational system. Thus, a great need for useful, practical workplace interventions that could reduce stress and enhance work engagement. Ideally, the practice of teaching profession ought to be given adequate consideration and concern in order to achieve standard educational delivery. It is a known fact that the current practice in teaching job is considered unfavourable due to the presence of hostile conditions, the classes in public schools are over populated with students in urban areas from basic, upper and post basic schools especially in Kano State. The ideal ratio of teacher per student in class in post basic schools varies and depend on the country and educational level. In Nigeria, the ideal population of students per class as provided in the National Policy on Education is specified, thus: "The teacher-pupils ratio at the post-basic education level shall be 1:40." (NPE, 2014). Inadequate attention and absence of childcare support for nursing mothers, absence of public transportation system to support female staff, decay in teaching and learning infrastructure, underfunding and poor renumeration, as well as workover load and the overpopulated classes will affect both the teacher and the students. There should be the provision of child care support for nursing mothers, provision of public transport system to reduce the burden befallen particularly on female teachers due to additional home management responsibilities. Adequate infrastructures should also be put in place in order to ease the difficulties in teaching, while adequate funding and adequate renumeration should serve as the motivational factor and lastly flexible working hours. Persistent stress causes mental health issues like depression and anxiety, which also affect the daily life societal activities, causing irritability, difficult to concentrate, loss of appetite or over eating, stomach upset, headache, body pains and trouble sleeping. Similarly, female teachers have other peculiar domestic responsibilities, while in teaching profession stress has a destructive impact on the health and well-being

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of individual teachers. Job related stress is higher in female teachers than their male counterpart, due to their additional domestic responsibilities. They are battling with balancing work and family life, classroom behaviour and discipline, managing work load and responsibilities, limited resources and sometimes lack of support from their spouse. All these could have impacted their health, overall wellbeing and job satisfaction. Job stress frequently resulted in reduced job satisfaction and lessened classroom performance that is why creating a stress-free teaching environment is essential for improving teachers' effectiveness and well-being. These and many more raise the alarm of conducting studies on the issue of job stress, as it affects the female teachers in post basic schools of Kano Municipal Zonal Education Directorate.

Objectives of the Study

Objectives of this study were to determine:

1. The effect of Behaviour Activation (BA) counselling technique on social dimension of job stress among female teachers of Post Basic schools in Kano Municipal Zonal Education Directorate.
2. The effect of Behaviour Activation (BA) counselling technique on time management dimension of job stress among female teachers of Post Basic schools in Kano Municipal Zonal Education Directorate.
3. The effect of Behaviour Activation (BA) counselling technique on emotional dimension of job stress among female teachers of Post Basic schools in Kano Municipal Zonal Education Directorate.

Research Questions:

The following research questions were raised in this study:

1. What is the effect of Behaviour Activation (BA) counselling technique on social dimension of job stress among female teachers of Post Basic schools in Kano Municipal Zonal Education Directorate of Kano State?
2. What is the effect of Behaviour Activation (BA) counselling technique on time management dimension of job stress among female teachers of Post Basic schools in Kano Municipal Zonal Education Directorate of Kano State?
3. What is the effect of Behaviour Activation (BA) counselling technique on emotional dimension of job stress among female teachers of Post Basic schools in Kano Municipal Zonal Education Directorate of Kano State?

Hypotheses:

The following Hypotheses were tested at 0.05 level of significant in the study:

Ho_1: There is no significant effect of Behaviour Activation (BA) counselling technique on social dimension of job stress among female teachers of Post Basic Education schools in Kano Municipal Zonal Education Directorate of Kano State.

Ho_2: There is no significant effect of Behaviour Activation (BA) counselling technique on time management dimension of job stress among female teachers in Post Basic Education schools in Kano Municipal Zonal Education Directorate of Kano State.

Ho_3: There is no significant effect of Behaviour Activation (BA) counselling technique on emotional dimension of job stress among female teachers in Post Basic Education schools in Kano Municipal Zonal Education Directorate of Kano State.

Methodology

The study adopted Quasi Experimental method in form of pretest post-test design. The population of this study comprised of female teachers in post-basic schools of Kano Municipal Zonal Education Directorate identified with job stress.. Hence, the population of this study stands as 109 female teachers identified with job stress in post- basic public schools in Kano Municipal Zonal Education Directorate. After the identification, school with highest number of identified female teachers with job stress was selected as sample.

Presentation of Results

The three null hypotheses formulated to guide the study were tested below in tabular form at 0.05 level of significance:

Ho_1: There is no significant effect of Behaviour Activation Counselling Technique on Social dimension of Job Stress of Female Teachers in Post Basic Schools in Kano Municipal Zonal Education Directorate.

Table 1: t-test for pre-test and post-test Social Dimension of Job Stress

Variables	N	Mean	S.D	Df	t	P .
Pre-test B.A. Soc.	15	37.00	3.208			
				14	11.720	000
Post-test B.A. Soc	15	28.20	3.278			

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Source: Field Data, 2025

Table 1 above shows the analysis for pre-test and post-test social mean scores of Female Teachers exposed to Behaviour Activation Counselling Technique treatment. The analysis shows that the t value is 11.720 with 14 as degree of freedom, P-value is 0.000 at 0.05 level of significance, as such, the P-value is less than level of significance. This revealed that, the null hypothesis which states that there is no significant effect of Behaviour Activation Counselling Technique on social dimension of Job Stress of Female Teachers in Post Basic Schools in Kano Municipal Zonal Education Directorate is rejected and maintained that, there is significant effect of Behaviour Activation Counselling Technique on social dimension of Job Stress of Female Teachers in Post Basic Schools in Kano Municipal Zonal Education Directorate.

Ho_2: There is no significant effect of Behaviour Activation Counselling Technique on Time Management dimension of Job Stress of Female Teachers in Post Basic Schools in Kano Municipal Zonal Education Directorate.

Table 2 t-test for pre-test and post-test Time Management Dimension of Job Stress mean scores:

Variables	N	Mean	S.D	Df	t	P .
Pre-test B.A. T.M	15	37.60	2.720			
				14	11.44	.000
Post-test B.A. T.M.	15	25.87	3.204			

Source: Field Data, 2025

Table 2 above shows the analysis for pre-test and post-test time management mean scores of female teachers exposed to Behaviour Activations Counselling Technique treatment. The analysis shows that the t value is 11.544 with 14 as degree of freedom, P-value is 0.000 at 0.05 level of significance, as such, the P-value is less than level of significance. This revealed that, the null hypothesis which states that there is no significant effect of Behaviour Activation Counselling Technique on Time Management dimension of Job Stress of Female Teachers in Post Basic Schools in Kano Municipal Zonal Education Directorate is rejected and maintained that, there is significant effect of Behaviour Activation counselling technique on Time Management dimension of Job Stress of Female Teachers in Post Basic Schools in Kano Municipal Zonal Education Directorate.

Ho_3: There is no significant effect of Behaviour Activation Counselling Technique on Emotional dimension of Job Stress of Female Teachers in Post Basic Schools in Kano Municipal Zonal Education Directorate.

Table 3 t-test for pre-test and post-test Emotional Dimension of Job Stress

Variables	N	Mean	S.D	Df	t	P .
Pre-test B.A. Emo.	15	35.13	4.068			
				14	10.332	.000
Post-test B.A. Emo.	15	27.27	2.764			

Source: Field Data, 2025

Table 3 above shows the analysis for pre-test and post-test emotional mean scores of Female Teachers exposed to Behaviour Activations Counselling Technique treatment. The analysis shows that the t value is 10.332 with 14 as degree of freedom, P-value is 0.000 at 0.05 level of significance, as such, the P-value is less than level of significance. This revealed that, the null hypothesis which states that there is no significant effect of Behaviour Activation Counselling Technique on emotional dimension of Job Stress of Female Teachers in Post Basic Schools in Kano Municipal Zonal Education Directorate is rejected and maintained that, there is significant effect of Behaviour Activation Counselling Technique on emotional dimension of Job Stress of female teachers in Post Basic Schools in Kano Municipal Zonal Education Directorate.

Summary of Findings

The major findings of this study are summarised as follows:

1. There is significant effect of Behaviour Activation counselling technique on time management dimension of Job Stress of female teachers in Post Basic Schools in Kano Municipal Zonal Education Directorate.
2. There is significant effect of Behaviour Activation counselling technique on social dimension of job stress of female teachers in Post Basic schools in Kano Municipal Zonal Education Directorate.
3. There is significant effect of Behaviour Activation counselling technique on emotional dimension of job stress of female teachers in Post Basic schools in Kano Municipal Zonal Education Directorate.

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Discussion of Results

This study set out to determine the effects of Behaviour Activation counselling technique on the three dimensions of job stress. The first finding revealed that Behaviour Activation counselling technique is significantly effective in the treatment of social dimension of job stress. The mean score decreased from 37.00 to 28.20 showing a notable reduction of 8.8. This effect was statistically significant (p = 0.000), leading to the rejection of the null hypothesis. This significant reduction in the social dimension after Behaviour Activation is consistent with a study conducted by Jones (2021) on the impact of behavioural activation on teacher stress and burnout: a multiple probe single case design. The study used a multiple probe single-case approach to examine the practicability, impact, and acceptability of Behaviour Activation counselling technique on the perceived stress, emotional experiences, and well-being of early career teachers. The population of the study comprised early career, K-12 teachers of public-school districts in Eastern North Carolina, and a purposive, convenience sampling technique was used. Behaviour Activation counselling technique was used as an intervention. The scales used included The Short Form Perceived Stress Scale (PSS-4), the Behavioural Activation Depression Scale-Short Form, and the Patient Health Questionnaire (PHQ-9), and the Final Evaluation Questionnaire was used to assess its effectiveness. It was conducted for two weeks in 45-minute sessions per week, and the statistical technique used was a combination of descriptive and inferential statistics. All consent forms and screening questionnaires were administered through Qualtrics, an online survey management tool. The intervention was conducted online via Zoom after school hours, and it proved effective in reducing teachers' stress and burnout. The second finding of this study revealed that Behaviour Activation is significantly effective in the treatment of time management dimension of job stress. The mean score decreased from 37.60 to 25.87 reflecting a substantial reduction of 11.8. This effect was statistically significant (p = .000), leading to the rejection of the null hypothesis. The third finding revealed that Behaviour Activation counselling technique is significantly effective in the treatment of emotional dimension of job stress. The mean score decreased from 35.13 to 27.27 showing a notable reduction of 7.86 This effect was statistically significant (p = 0.000), leading to the rejection of the null hypothesis. This significant reduction in the emotional dimension after Behaviour Activation is consistent with a study conducted by Barekat et el (2021) on effectiveness of Behaviour Activation and Mindfulness-Based Stress Reduction interventions on emotional balance and cognitive avoidance in female students with depressive symptoms. The population of the study comprised female students at Isfahan State University Iran, who exhibited depressive symptoms during the 2022-2023 academic year, and were referred to the university's Counselling Centre. Forty-five (45) students were selected as sample and randomly assign to three groups (for behaviour activation, for mindfulness-based intervention and control group). IT was a pre-test post-test quasi experimental design. The data collection instruments include Scale of Positive and Negative Experience (SPANE) and the Cognitive Avoidance Questionnaire (CAQ) which were administered to all participants. ANOVA and Bonferroni post-hoc test in SPSS were used for data analysis. Findings of the study revealed that both Behaviour Activation and Mindfulness-Based Stress Reduction interventions are effective in improving emotional balance.

Conclusions

Base on the outcomes of this study, the conclusions were drawn that Behaviour Activation Counselling Technique is significantly effective on social dimension of Job Stress of Female Teachers in Post Basic Schools in Kano Municipal Zonal Education Directorate. This was when the analysis of pre-test and post-test results of Female Teachers of Post-Basic Schools in Kano Municipal Zonal Education Directorate exposed to Behaviour Activation treatment was conducted. It was also concluded that Behaviour Activation Counselling Technique is significantly effective on time management dimension of Job Stress of Female Teachers in Post Basic Schools in Kano Municipal Zonal Education Directorate. This was when the analysis of pre-test and post-test results of Female Teachers of Post-Basic Schools in Kano Municipal Zonal Education Directorate exposed to Behaviour Activation treatment was conducted. The study also concluded that Behaviour Activation Counselling Technique is significantly effective on emotional dimension of Job Stress of Female Teachers in Post Basic Schools in Kano Municipal Zonal Education Directorate. This was when the analysis of pre-test and post-test results of Female Teachers of Post-Basic Schools in Kano Municipal Zonal Education Directorate exposed to Behaviour Activation treatment was conducted.

Recommendations

Based on the findings of this study, the following recommendations were made:

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1. Since Behaviour Activation Counselling Technique significantly reduced the social dimension of Job Stress, it is recommended that Behaviour Activation-based counselling sessions be organised to improve social support and interactions among female teachers in Post Basic Schools in Kano Municipal Zonal Education Directorate.
2. Since Behaviour Activation Counselling Technique significantly improved the Time Management dimension of Job Stress, it is recommended that school counsellors incorporate Behaviour Activation strategies focused on enhancing time management skills among female teachers in Post Basic Schools in Kano Municipal Zonal Education Directorate.
3. Since Behaviour Activation Counselling Technique significantly reduced the Emotional dimension of Job Stress, it is recommended that counselling interventions using Behaviour Activation incorporate emotional regulation and coping skills training for female teachers in Post Basic Schools in Kano Municipal Zonal Education Directorate.

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Digital School Management System in the 21st Century Education: Necessary, not a Luxury

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Abstract

This paper investigates Digital School Management Systems (DSMS) as a strategic necessity rather than a luxury in 21st-century education. As schools increasingly operate within data-driven and accountability-focused environments, traditional manual administrative systems have become inadequate. The research investigates DSMS as a concept which consists of essential elements and institutional operations that enable educational institutions to manage student data, employee records, financial tasks, academic activities and stakeholder interactions through centralized digital systems. The paper applies Rogers' Diffusion of Innovations Theory together with Bandura's collective efficacy framework to describe how technological and social factors influence DSMS adoption. The Nigerian situation receives special focus because growing population numbers and resource shortages and government problems create an urgent requirement for effective data management solutions. Despite infrastructural and capacity constraints, evidence suggests that DSMS enhance decision-making, transparency, and institutional effectiveness. The paper concludes that digital school management constitutes essential infrastructure for sustainable educational governance and national development in the digital age.

Keywords: Digital School, Management, 21st Century, Education

Introduction

Education in the 21st century is shaped by digital transformation, rapid globalization, and increasing demands for transparency, quality assurance and accountability. Modern educational institutions need to perform two functions, which require them to deliver educational content and to function as intricate systems that handle extensive student, staff, financial, curriculum and assessment, and institutional development data. As education systems become more data-driven and performance-oriented, traditional manual methods of school administration are increasingly inadequate. The global shift toward digital transformation has reinforced and re-improved the need for schools to adopt technological solutions that enhance accuracy, efficiency, and institutional decision-making. The adoption of Information and Communication Technology (ICT) has brought about fundamental changes to organizational systems, which includes the educational sector. ICT enables the development of Management Information Systems (MIS) that support data processing, communication, planning, and decision-making. Such systems enhance stakeholder communication, improve administrative efficiency, promote transparency and collaboration, and support teaching and learning. Digital School Management Systems (DSMS) which people also refer to as School Management Information Systems (SMIS) and Education Enterprise Resource Planning (ERP) systems, provide educational institutions with software tools that handle student enrollment, attendance, academic performance, staff records, finances, and parent communication and reporting (Ramadani et al., 2025). The DSMS system provides educational institutions with the capability to manage all their data through a single platform, which enables them to access current information and make decisions based on verified facts while it helps them decrease errors, delays, and inefficiencies. Globally, smart technologies such as digital learning platforms, the Internet of Things (IoT), and artificial intelligence are redefining educational administration. The COVID-19 pandemic further highlighted the limitations of traditional systems and accelerated digital adoption in schools. In Nigeria, the urgency for digital transformation is heightened by limited funding, population growth, and increasing demand for quality education. ICT

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adoption has shown potential to improve administrative efficiency and institutional effectiveness yet implementation suffers from multiple challenges which include infrastructure deficits, unreliable electricity, poor internet connectivity and inadequate digital skills (Okonkwo & Okonkwo, 2023; Kurniasih, 2023). Despite these barriers, digital transformation remains crucial for improving educational outcomes. DSMS facilitate strategic planning, accountability, transparency, and efficient resource management, optimize limited resources, enabling schools to track student performance, and evaluate teacher effectiveness. Nevertheless, some administrators seem still perceive these systems as optional due to resistance to change, cost concerns, or limited awareness of long-term benefits. Digital management systems have become essential for organizations to succeed in the Fourth Industrial Revolution because workplaces now require employees to master digital skills and data literacy. In Nigeria, these systems are not merely administrative tools but national development priorities, supporting inclusive policies and bridging educational inequalities. Schools that embrace digital management systems are positioned to deliver higher-quality education, enhance institutional efficiency, and contribute to national development. DSMS, therefore, are a strategic necessity rather than a luxury for 21st-century education.

Concept of Digital School Management Systems

Digital School Management Systems (DSMS) represent a modern evolution of educational administrative technologies which schools use to handle their complete operational needs through digital systems. The systems operate on Management Information Systems (MIS) and Education Management Information Systems (EMIS) which combine human resources with organizational workflows and technological systems to create an educational information system that supports decision-making processes. The digital world functions as an institutional framework which DSMS provide to schools for their operation in educational settings that use data as their primary resource (Adhikari et al., 2024). Digital school management systems function as complete software solutions which enable schools to handle their operational needs through automated digital systems that control the entire school process from planning to execution. Worldwide, EMIS defines education data systems as complete systems which gather educational information and process it to create analysis that supports institutional planning and administrative operations. These systems enable education managers to enhance administrative efficiency and improve institutional performance through structured data use (UNESCO, 2025).

The educational management information system EMIS functions as a unified framework which connects various elements such as people, institutions, technology and operational methods to generate accurate educational data which supports decision-making throughout all administrative levels. The data management systems which educational institutions use typically contain information about their students, staff members, their facilities and financial assets while delivering analytical tools that organizations use for their planning and monitoring and assessment activities (UNESCO International Institute for Educational Planning [IIEP], 2024). More comprehensively, EMIS and related digital school systems are defined as integrated mechanisms for the collection, processing, maintenance, dissemination and integration of educational data to support policy formulation, monitoring, planning, and management at all levels of the education system. These systems combine governance structures, technological tools, and institutional procedures to provide timely, relevant and reliable information for education leaders and school administrators (UNESCO-UNEVOC, 2024). Building on these foundations, Digital School Management Systems specifically focus on institution-level administration and operational management. DSMS extend traditional EMIS functions by providing user-friendly, and school-level software solutions that integrate daily administrative operations into unified digital environments. Educational institutions use these systems which educators commonly call School Management Information Systems (SMIS) and Education Enterprise Resource Planning (ERP) systems because these systems enable educational institutions to connect their various operational departments (Forrester, 2019).

Core Functional Components of Digital School Management Systems

Digital School Management Systems typically cover multiple functional domains that collectively support school administration. These include:

1. Student Information Management: The system provides centralized databases which allow schools to handle all aspects of student data. The system enables schools to track student enrollment, demographic information, academic performance, attendance, disciplinary history, and academic progress. Centralized student data management reduces duplication, improves accuracy, and supports long-term educational planning. Integrated student data systems enable

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real-time access to student information which educational institutions need for making timely decisions and providing personalized student assistance (Adhikari et al., 2024).

2. Staff Records and Human Resource Management: DSMS supports schools in managing their staff data which includes teacher information, attendance records, performance evaluation results, payroll data and professional development records. Digital HR modules help schools manage workforce resources efficiently while improving transparency and accountability in personnel management (Adhikari et al., 2024).
3. Academic Planning, Teaching, and Assessment Management: Academic modules enable schools to handle all aspects of curriculum planning, timetabling, lesson scheduling, examination management, grading, and performance analytics. Schools can use digital academic processes to monitor student learning outcomes and enable data-based teaching decisions (Forrester, 2019).
4. Communication with Parents and Stakeholders: Current DSMS systems provide educational institutions with multiple communication channels that include messaging systems, digital notice boards and mobile app functions. The tools enable teachers, parents, students and administrators to work together better which leads to improved stakeholder participation and better educational results (UNESCO, 2025).
5. Financial and Resource Management: The financial modules allow schools to control all aspects of their finances which include fee collection, budgeting, procurement, payroll and asset management. Financial tracking systems that operate together with each other create better accountability standards which help to prevent financial losses and ensure correct resource distribution (Adhikari et al., 2024). Digital school systems use these operational areas to achieve their primary goal of establishing central control over school activities which enables schools to make unified decisions. The integration of management information systems within educational administration has been shown to boost operational efficiency while optimizing resources and enabling data-driven strategic planning across all management levels (Adhikari et al., 2024).

DSMS as Integrated Institutional Decision-Support Systems

A key defining feature of digital school management systems is data centralization and real-time accessibility. Traditional paper-based systems often result in fragmented data storage, delayed reporting, and increased risk of data loss. In contrast, the digital systems create unified data systems which allow administrators to produce instant reports and analytical data (Forrester, 2019).). Globally, education data systems have evolved from simple school census tools to complex digital infrastructures integrating multiple data sources, including human resource systems, assessment results, and financial records. This evolution reflects the growing importance of data-driven governance in education systems (UNESCO, 2025).

Reliable digital data systems enable education administrators to monitor school performance, allocate resources effectively, deploy teachers strategically, and address inequalities within education systems. Evidence suggests that investment in education data systems produces significant returns, particularly in low-and middle-income countries, where efficient resource allocation is critical (UNESCO, 2025). At the institutional level, digital school management systems serve as operational tools that translate national data strategies into daily administrative practices. The systems establish data-informed operational systems which enable educational institutions to adapt to new policies, stakeholder needs and performance evaluation standards (UNESCO Institute for Statistics, 2025).

DSMS and the Digital Transformation of Educational Administration

The concept of digital school management systems is closely tied to the broader digital transformation of education. Schools today operate within knowledge economies where data accuracy, speed of communication, and operational transparency are essential. Digital systems therefore act as foundational infrastructures that support modern educational governance (Forrester, 2019). The scholarly reviews demonstrate that MIS integration helps school administration to improve decision-making processes and increase operational efficiency while maximizing resource usage. The management information system (MIS) functions as a strategic planning tool that enables institutional performance improvement while decreasing administrative workload (Adhikari et al., 2024). Digital school systems operate within global education governance frameworks that include the Sustainable Development Goals (SDGs), which require data-driven policy implementation, and education outcome monitoring. International organizations such as UNESCO promote EMIS and related systems as essential tools for education planning, budgeting, and policy monitoring across national and institutional levels (UNESCO Institute for Statistics, 2025).

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DSMS in the Context of Developing Countries and Nigeria

In developing countries such as Nigeria, digital school management systems have significant strategic importance. Educational institutions which experience high population growth while facing limited resources, need to implement efficient data management systems. The DSMS system enables organizations to enhance their administrative operations through better administrative transparency, improved planning methods and fair resource distribution systems (Iwogbe et al., 2024). Research from Nigerian contexts highlights the transformative role of EMIS in strengthening primary education administration and improving overall system efficiency. The integration of digital data systems enhances institutional effectiveness and supports sustainable education development (Iwogbe et al., 2024). The DSMS system functions as a technological solution that organizations use to transform their institutions into modern educational systems which enable efficient governance, accountability and service delivery.

DSMS as Institutional Necessities in the 21st Century

Digital school management systems have transformed from being optional technology solutions to becoming essential components of educational infrastructure. The successful operation of contemporary educational institutions requires educational administrators to obtain accurate information without delay. Schools encounter various operational difficulties which include slow reporting processes, incorrect information, inadequate resource monitoring, and ineffective communication methods (Forrester 2019). Schools need digital management systems because they provide essential technology for evidence-based school leadership, institutional transparency and efficient service delivery. The increasing data-driven nature of education systems will make DSMS an essential factor which determines how educational institutions function, how educational policies are executed and how educational quality i(UNESCO 2025). The implementation of DSMS systems proves vital for educational systems in Nigeria and other developing countries. The systems strengthen educational governance, enhance data accuracy and support national development objectives through their planning capabilities. Digital school management systems function as fundamental elements which educational institutions need to operate their administrative functions (Iwogbe et al 2024.

Rationale for Digital School Management in the 21st Century

The rationale for digital school management in the 21st century is rooted in the changing nature of educational institutions, increasing administrative demands, heightened expectations for accountability, and the growing importance of data-driven decision-making. Schools develop into complex organizations which need specialized administrative systems because their operational requirements have grown beyond manual methods. The Digital School Management Systems (DSMS) establish the necessary technological and structural framework which helps educational institutions tackle emerging challenges and maintain proper school management throughout the modern educational landscape.

Increasing Administrative Complexity

Schools need to handle growing student numbers, multiple academic programs, staff training requirements, financial operations and their extensive need for school reporting. The responsibilities of school operations have expanded because of educational reforms, curriculum diversification, inclusive education policies and additional regulatory requirements. The school administration system now requires more complex operations which need high volume data processing and urgent response capabilities compared to the previous time period. The manual administrative systems of organizations maintain incomplete records which result in unnecessary work and create delays when staff members try to access information. The systems are prone to human mistakes, data deletion and data inconsistencies which become worse in educational institutions that have large student populations and experience rapid growth. Research shows that schools' use of paper-based systems for administrative tasks creates operational delays, extended reporting times and weak cooperation between different departments (Forrester, 2019). In contrast, digital management systems integrate administrative functions into centralized platforms, thereby reducing redundancy and improving operational efficiency. The system automates essential administrative duties which include student registration, attendance monitoring, staff record upkeep, exam management and financial operations. The system uses automation to decrease administrative tasks while it improves record-keeping accuracy and record-keeping consistency. The implementation of Management Information Systems (MIS) in school administration results in better organizational performance and institutional unit coordination (Adhikari et al., 2024). In the Nigerian context, administrative complexity is further intensified by limited administrative personnel, large class sizes, and inadequate record-keeping infrastructure. Many schools still rely on manual registers and paper files, which

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are difficult to manage, especially in urban and densely populated areas. Digital systems provide scalable solutions that enable schools to manage growth effectively while maintaining accurate and up-to-date records. The increasing complexity of administrative tasks requires schools to implement digital school management systems during the 21st century.

Demand for Accountability and Transparency

Another critical rationale for digital school management is the growing demand for accountability and transparency in educational governance. Contemporary education systems operate under increased scrutiny from multiple stakeholders, including funding bodies, government agencies, parents, and accreditation organizations. These stakeholders expect accurate documentation, timely reporting, and transparent use of resources. Education requires reliable data which can be verified through established methods for maintaining accountability standards. Traditional manual systems often lack essential features which help to verify data accuracy, create audit trails and deliver real-time reporting functions essential for maintaining operational transparency. Digital School Management Systems address these limitations by providing traceable records, automated reporting functions, and secure data storage. The system features help institutions maintain their accountability standards while protecting institutional financial resources from unauthorized access and data tampering (UNESCO, 2025).

Globally, international organizations emphasize the role of Education Management Information Systems (EMIS) in strengthening accountability and governance in education. UNESCO identifies digital education data systems as essential tools for monitoring school performance, managing resources, and ensuring transparency in educational administration (UNESCO Institute for Statistics, 2025). Digital systems also support compliance with regulatory requirements by enabling schools to generate standardized reports for inspection and accreditation purposes. In Nigeria, public officials demand digital accountability systems because they believe that school administration lacks transparency in three areas: student assessment, fee management, and staff deployment. Digital school management systems enhance trust among stakeholders by providing accurate, accessible, and verifiable information. Parents can monitor student attendance and performance, while government agencies can assess institutional compliance and performance using standardized digital data. The current educational environment requires digital school management systems because schools need to demonstrate their accountability and operational transparency to various stakeholders.

Data-Driven Decision-Making

Data-driven decision-making has become a crucial requirement for effective educational leadership in modern educational environments. School leaders need to make well-informed decisions about multiple areas, including enrollment strategies, resource distribution, teacher assignment, curriculum delivery, and student assistance programs. The most effective decision-making process requires organizations to use data, which must be accurate, timely, and complete. Educational institutions use Digital School Management Systems to collect, analyze, and display their educational data in a structured manner. The dashboard and analytics tools enable administrators to track student enrollment trends, attendance patterns, academic performance levels, and resource usage throughout the school. These insights support strategic planning and early identification of learning challenges and evidence-based policy implementation (Forrester, 2019). Research consistently demonstrates that Management Information Systems enhance the quality of administrative decision-making by improving access to relevant and reliable information. Adhikari et al. (2024) explain that schools using digital management information systems, which provide real-time data, gain advantages for strategic planning and ongoing improvements. The EMIS frameworks established by UNESCO require educational systems to use data for their planning, monitoring, and evaluation activities (UNESCO, 2025). Nigeria requires data-driven decision-making because its educational resources remain limited while access and quality educational opportunities continue to face persistent inequalities. School leaders use digital systems to detect performance deficiencies, which enables them to distribute resources effectively and create specific programs that help students from underprivileged backgrounds. By transforming raw data into actionable insights, DSMS empower school administrators to respond proactively to emerging challenges and align institutional practices with national education goals.

Digital School Management Systems: Necessary, not a Luxury

The debate over whether Digital School Management Systems (DSMS) constitute a necessity or a luxury in education often stems from a traditional perception that separates technology from the core functions of schooling. The viewpoint

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maintains that educational activities can proceed without current modern administrative systems. The distinction between these two elements becomes impossible to maintain in modern educational environments. Digital education systems require educational institutions to operate with digital technology that provides quick results and precise information together with complete operational control and flexible performance capabilities which manual systems cannot deliver. People who consider DSMS to be non-essential educational tools generally show resistance to change while they show limited digital skills and they worry about expenses especially in developing nations like Nigeria. People develop understandable concerns but they fail to recognize the technology which now functions as a fundamental component of institutional operations. Digital systems no longer serve as supplementary elements; they now act as essential components that drive contemporary business operations. Schools, like other complex institutions, must manage large volumes of data related to students, staff, finance, curriculum delivery, and external reporting. Digital management systems serve as essential tools which help educational institutions build their institutional capabilities and achieve their educational objectives (UNESCO 2021).

The need for Digital School Management Systems becomes increasingly critical in Nigeria because educational institutions across the country and worldwide are adopting digital technologies for their educational activities. Government agencies increasingly require electronic data submission for accreditation, funding, monitoring, and evaluation. The examination system together with the admissions process operates mainly through computer systems which enable stakeholders like parents and donors to obtain precise information without delays. Schools that depend on manual systems face multiple risks which include slow operations, inconsistent data, poor governance and failure to meet legal requirements. The World Bank (2020) notes that weak administrative systems are a major barrier to effective school management in low- and middle-income countries, and that digital solutions significantly improve transparency and service delivery. Moreover, DSMS contribute directly to institutional competitiveness and sustainability. In an era of school choice and global benchmarking, institutions that employ efficient digital systems are better positioned to attract students, staff, partnerships, and funding. OECD (2019) argues that digital maturity has become a key indicator of organizational quality in education, influencing public trust and institutional reputation. Educational institutions that lack operational digital management systems now look outdated because they fail to meet current educational standards.

Importantly, classifying DSMS as a luxury ignores the long-term cost implications of manual administration. While initial investment in digital systems may be perceived as high, the long-term benefits reduced paperwork, minimized errors, improved efficiency, and better resource utilization, often outweigh the costs. The implementation of digital administrative systems enables organizations to achieve long-term cost reductions because these systems enhance their planning processes and decrease their operational waste (Fullan, 2019). Digital School Management Systems function as vital educational infrastructure which schools need to operate effectively just like they require classrooms, trained educators and teaching resources. In the 21st century, effective school management without digital systems is increasingly impractical. For Nigeria to achieve its educational development goals and remain competitive in a globalized world, DSMS must be embraced not as optional enhancements, but as indispensable tools for modern school governance and educational excellence.

Challenges and Solutions to Adoption of Digital School Management Systems

Despite the recognized benefits of Digital School Management Systems (DSMS), their adoption in many Nigerian schools remains limited. The present obstacles which schools face originate from structural problems, human resources shortages, financial constraints and institutional difficulties. The solution needs dedicated policy development together with skills enhancement and planned financial backing to succeed instead of treating digital systems as non-essential components. One of the most significant barriers to the adoption of DSMS in Nigeria is inadequate ICT infrastructure. Many schools, particularly in rural and underserved areas lack both electrical power, internet access, and essential computer equipment. Digital systems need basic infrastructure to operate properly. The World Bank (2021) identifies infrastructure gaps as a major constraint to digital transformation in education across sub-Saharan Africa. In this scenario, the government should use public funding, educational intervention programs and public-private partnerships to support school ICT infrastructure development. Schools without electrical grids can access affordable power through solar energy systems while utilizing mobile networks for broadband internet access. In addition, cloud-based DSMS that operate on low bandwidth and mobile devices can reduce dependence on expensive physical infrastructure. The success of DSMS systems relies primarily on the digital skills which school leaders and their support personnel possess. Digital administration training did not exist during

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the time when many school leaders received their training which created challenges for them because they lacked confidence and had restricted technical abilities. The OECD (2020) research shows that school success with technological implementation depends on the digital literacy skills of school leaders. In this situation, the solution requires schools to establish specific training programs which will help their administrators improve their digital leadership abilities. Educational ministries and teacher training institutions together with professional associations should include digital management skills in their leadership training and certification programs. Fullan (2019) states that ongoing practical training together with peer mentoring systems will make it possible to develop skills in a sustainable way. Schools become reluctant to implement DSMS because they perceive software and hardware expenses together with training and maintenance costs as excessive. Public schools and low-fee private institutions face budget problems which make financial resources difficult to obtain. Organizations which assess digital systems only based on initial expenses fail to recognize the future financial advantages these systems bring. In this situation, the solution requires school owners and government bodies to implement gradual deployment plans which will enable them to distribute expenditures across various time periods. Schools can save money through open-source DSMS solutions which eliminate the need to pay for software licenses. The process of centralized buying together with shared digital systems at district or state levels enables organizations to achieve cost savings through bulk purchasing advantages. The World Bank (2020) emphasizes that digital investment in school management yield long-term efficiency gains that outweigh initial expenditures. Resistance to change remains a persistent challenge, often rooted in fear of job displacement, increased accountability, or unfamiliar technology. Some administrators and staff prefer to work with manual systems because they consider these systems easier to understand while they doubt the reliability of digital systems. According to Rogers' (2003) Diffusion of Innovations theory, resistance is common when innovations challenge established practices. In this case, change management strategies should accompany DSMS implementation. The organization needs to educate stakeholders about digital system advantages through its educational programs, pilot projects and collaborative decision-making methods. The organization can ease employee concerns through DSMS demonstration which shows that DSMS functions as a support system for employees who need to carry out their tasks. Early adopters within schools can serve as change champions to encourage wider acceptance. As schools digitize records, concerns about data privacy, unauthorized access, and cyberattacks become increasingly prominent. The lack of strong regulatory frameworks and the insufficient cybersecurity skills of staff members create higher security threats to Nigerian educational institutions. UNESCO (2021) warns that inadequate data protection measures can undermine trust in digital education systems. In this case, clear data protection policies aligned with national regulations, such as Nigeria's Data Protection Act, should guide DSMS use. Schools must adopt secure platforms with encryption, role-based access, and regular data backups. Training administrators on basic cybersecurity practices and partnering with reputable technology providers can further mitigate risks. National education authorities should also provide standardized guidelines for data governance in schools.

Theoretical Framework

Rogers' Diffusion of Innovations (DOI) Theory and Bandura's Social Cognitive Theory, which includes the concept of collective efficacy, explain the way schools today implement Digital School Management Systems (DSMS) in their operations. The two theories together explain how organizations adopt new technologies while social factors shape their successful technology implementation. Rogers' Diffusion of Innovations Theory explains that social systems determine how people perceive new ideas before they will accept them. According to Rogers (2003) people will adopt new ideas when they see the ideas as better than what they already know and the ideas work well with their current methods and they find the ideas easy to understand and they see the ideas actual results. In the case of DSMS, schools are more likely to adopt digital systems when they perceive clear benefits over manual methods, such as improved efficiency, transparency, and data-driven decision-making. The adoption process will experience delays because people perceive technical challenges while their ICT skills remain inadequate. The ability to test pilot programs allows people to see administrative process improvements which promotes greater program acceptance. The DOI framework accounts for differences between schools regarding their DSMS implementation levels and their DSMS implementation speeds.

The Social Cognitive Theory developed by Bandura supports this view because it demonstrates how staff members build collective efficacy through their belief in their ability to implement and operate DSMS systems. Successful technology implementation requires both the actual technological solution and the backing of the institution, dedication from leaders,

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professional training, and proper system resources. The implementation of digital tools becomes sustainable and effective when teachers and school leaders together believe in their ability to use these tools (Bandura, 1997). The combination of these two theories delivers an extensive understanding of DSMS which functions as both a technological development and a socially driven process that organizations use to enhance their administrative operations and educational standards.

Implications for Educational Management and Policy

The necessity of Digital School Management Systems (DSMS) for Nigerian educational management and policy development has become established as a basic requirement. The current education systems require new approaches because they rely on both data and technological systems for their operations. Schools need to update their leadership methods and their policy frameworks because these changes will enable better digital governance practices and institutional growth through better accountability systems. Schools now manage their operations through digital systems which represent a complete transformation of educational institutions from their base planning processes to stakeholder expectations. The development of digital leadership skills among school leaders stands as the main focus of this transformation. Effective use of DSMS goes beyond basic computer literacy and requires administrators to strategically integrate digital tools into planning, monitoring, decision-making, and evaluation processes. School leaders play a significant role in shaping organizational culture and guiding technology adoption, making it essential for principals and education managers in Nigeria to be equipped with the necessary skills to actualize and interpret digital data, manage information systems, and lead change in technologically evolving environments. The implementation of sustainable DSMS requires its intentional integration into educational systems of national and state education systems. The absence of consistent implementation methods leads to operational problems that make it difficult for schools to provide equal educational opportunities. Embedding digital school management within education sector plans, quality assurance mechanisms, and accreditation requirements would promote consistency, accountability and standardization in both private and public institutions. Such policy alignment ensures that digital management systems support broader educational goals rather than operate as isolated initiatives. The organization of human resources development activities needs to become more essential because it plays a vital role in success operations. Continuous professional development programs are necessary to build the confidence and competence of administrators, teachers, and support staff in the use of DSMS. These programs should emphasize not only technical proficiency but also data-informed decision-making and ethical digital practices. Digital school management requires dependable ICT infrastructure which must include continuous electricity supply, internet access and suitable computer equipment. Prioritizing infrastructure investment, especially in public and rural schools will help bridge digital disparities. Finally, clear guidelines on data protection, ethical use, and cybersecurity are essential to maintain public trust, safeguard sensitive information, and ensure responsible digital governance in Nigerian schools.

Conclusion

Digital School Management Systems (DSMS) serve as vital tools for educational administration in 21st century educational institutions. The increasing use of data in schools requires new systems because manual approaches cannot deliver the needed operational efficiency, system transparency and stakeholder responsibility. DSMS provide educational institutions with complete digital systems that help them control their operations, make better decisions and achieve higher performance levels. In contexts such as Nigeria, where educational systems face resource constraints and rising expectations, digital school management is not optional but necessary. Although challenges such as limited digital skills and infrastructure gaps persist, they call for strategic investment and policy support rather than resistance. Grounded in innovation and collective effort, DSMS represent a foundational component of modern educational governance and sustainable development.

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Mediating Role of Job Satisfaction in the Relationship Between Principal Leadership Styles and Teacher Job Performance in Delta State, Nigeria

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Abstract
This research examined how job satisfaction mediates the connection between principal leadership styles and teacher job performance in public secondary schools in Delta State, Nigeria. The study was guided by four research questions and hypotheses, aiming to explore the dynamics between leadership styles, job satisfaction, and teacher performance. A correlational survey design was used, involving a population of 20,251 teachers and principals across the state. A sample of 587 participants, including 311 teachers and 22 principals, was selected through multi-stage cluster sampling. Data were gathered using a self-developed questionnaire titled the Leadership Styles, Job Satisfaction, and Teacher Job Performance Questionnaire (LSJSJPQ), which had a reliability coefficient ranging from 0.71 to 0.88. The analysis incorporated coefficient of determination and regression analysis. The results indicated that principal leadership styles significantly influenced both teacher job performance and job satisfaction. Furthermore, job satisfaction was found to play a mediating role between leadership styles and teacher job performance. The study concludes that principal leadership styles are essential for shaping teacher outcomes and recommends improving leadership training, encouraging teacher participation in decision-making, enhancing work conditions, and regularly evaluating job satisfaction.
Keywords: Principal Leadership Styles, Job Satisfaction, Teacher Job Performance, Mediating Role.

Introduction
The impact of school leadership on teacher performance has been extensively acknowledged in educational research, with an increasing body of evidence demonstrating the significant role principals play in enhancing the effectiveness and motivation of teaching staff (Berhanu, 2025). Leadership in schools is crucial not only in shaping the overall school environment but also in directly affecting individual teacher performance. The leadership style chosen by a principal can profoundly influence teacher morale, job satisfaction, and work outcomes, which subsequently impact their performance in the classroom (Khalida et al., 2022). Studies indicate that different leadership styles, including autocratic, democratic, and laissez-faire, are instrumental in shaping how teachers view their roles, their job satisfaction, and their capacity to perform well (Maqbool et al., 2024). While much research has been conducted on the broader effects of leadership styles in educational settings, there is a notable gap in examining how these styles specifically influence teacher performance, particularly through the mediating factor of job satisfaction. This gap is especially evident in Nigerian secondary schools, where leadership practices and teacher performance are shaped by distinctive regional factors. Recent research has emphasized the crucial role of job satisfaction in mediating the relationship between leadership styles and employee performance in various organizational settings (Samavia et al., 2023). In the field of education, job satisfaction is particularly vital, as it directly impacts teachers' motivation, engagement, and overall job performance (Berhanu, 2025). Teachers who feel supported by their principals and are satisfied with their working conditions tend to be more motivated, resulting in improved job performance (Alabi & Okunade, 2022). While the connection between job satisfaction and performance has been widely studied, the specific role of job satisfaction in mediating the relationship between leadership styles and teacher performance in Nigerian schools remains underexplored (Khalida et al., 2022). Considering the challenges teachers face in public secondary schools, such as inadequate resources, overcrowded classrooms, and limited opportunities for professional development, it is crucial to examine how leadership styles affect teacher job satisfaction and, consequently, their performance, to better understand the dynamics at play. The connection between leadership styles and job satisfaction has been extensively explored in organizational behavior research, where effective leadership is found to cultivate a positive work environment that enhances employee performance (Samavia et al., 2023; Maqbool et al., 2024). In educational settings, principals who adopt a democratic leadership style, which prioritizes inclusivity and support, have

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been shown to foster an environment where teachers feel valued and motivated to improve their performance (Nila et al., 2025). In contrast, principals who use autocratic leadership styles, characterized by more directive and authoritative approaches, may create a work environment that limits teacher autonomy and satisfaction, potentially leading to reduced performance (Berhanu, 2025). Similarly, laissez-faire leadership, which involves minimal involvement and guidance from the principal, can result in a lack of direction, causing dissatisfaction among teachers and negatively affecting their performance (Khalida et al., 2022). These differing effects of leadership styles underscore the importance of understanding how various leadership approaches influence teacher satisfaction and, consequently, their job performance.

In the Nigerian education system, teachers' job satisfaction is closely tied to their working conditions, including support from leadership, compensation, and opportunities for professional growth (Khalida et al., 2022). Teachers who are satisfied with their work are generally more committed to their roles and show higher levels of engagement in their teaching, which has been linked to better student outcomes (Maqbool et al., 2024). Research indicates that leadership practices focused on teacher development and support play a key role in enhancing job satisfaction, which, in turn, can improve teacher performance (Nila et al., 2025). However, the role of job satisfaction as a mediator in the relationship between leadership styles and teacher performance in secondary schools in Nigeria remains a largely unexplored area of research. Understanding this dynamic is crucial, especially in regions like Delta State, where teachers face distinctive challenges such as inadequate infrastructure, limited resources, and low morale. The Nigerian educational system has undergone substantial reforms aimed at enhancing educational quality and teacher performance. However, much of the focus has been placed on technical and pedagogical improvements, with less attention given to the impact of leadership styles on teacher performance through job satisfaction. Considering the pivotal role of teacher performance in shaping student outcomes, it is essential to understand how principal leadership practices can enhance teacher satisfaction and boost performance. Investigating the mediating role of job satisfaction in the relationship between principal leadership styles and teacher performance is therefore crucial, especially in the Nigerian context, where leadership practices are shaped by local socio-economic and cultural factors. This study aimed to fill this gap by exploring how principal leadership styles influence teacher job performance through job satisfaction in public secondary schools in Delta State.

Statement of the Problem

In the Nigerian education system, particularly in public secondary schools, teacher performance plays a crucial role in determining educational quality. However, teacher performance is often shaped by various factors, with leadership being one of the most influential. Principals, as school leaders, have the ability to influence the work environment through their leadership styles, which can either enhance or impede teacher motivation and productivity. Although leadership is recognized as a key factor in influencing teacher performance, there is a lack of comprehensive understanding about how different leadership styles—autocratic, democratic, and laissez-faire—affect teacher job satisfaction and, in turn, their performance. The gap in knowledge regarding the direct and indirect effects of leadership styles on teacher performance, particularly through the mediating role of job satisfaction, is a critical issue that needs to be addressed.Public secondary schools in Delta State, like many other regions in Nigeria, face numerous challenges that impact both leadership practices and teacher performance. Issues such as inadequate infrastructure, limited resources, poor working conditions, and a lack of professional development opportunities compound the difficulties teachers experience in these areas. Despite their crucial role in shaping school culture and influencing teacher performance, principals often work within these challenging environments. As a result, it is essential to understand how leadership practices can either support or hinder teacher outcomes. Without a comprehensive examination of the relationship between leadership styles, job satisfaction, and teacher performance, there is a risk of perpetuating ineffective leadership practices that fail to meet the needs of teachers, ultimately compromising the quality of education in the region. This study, therefore, plays an important role in exploring these dynamics and offering insights into how leadership styles can be better aligned with teachers' needs to enhance performance.

Purpose of the Study

The primary objective of this study is to investigate the mediating role of job satisfaction in the relationship between principal leadership styles and teacher job performance in public secondary schools in Delta State. The study aims to explore how various leadership styles (autocratic, democratic, and laissez-faire) directly and indirectly impact teacher job performance through job satisfaction. Specifically, the study seeks to:

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1. Determine the relationship between principal leadership styles and teacher job performance.
2. Examine the relationship between principal leadership styles and teacher job satisfaction.
3. Determine the relationship between job satisfaction and teacher job performance.
4. Investigate the mediating role of job satisfaction in the relationship between principal leadership styles and teacher job performance.

Research Questions

The study was guided by the following research questions:

1. What is the relationship between principal leadership styles and teacher job performance?
2. What is the relationship between principal leadership styles and teacher job satisfaction?
3. What is the relationship between job satisfaction and teacher job performance?
4. Does job satisfaction mediate the relationship between principal leadership styles and teacher job performance?

Hypotheses

The study was guided by the following null hypotheses, tested at the 0.05 significance level:

H_{o1}: There is no significant relationship between principal leadership styles and teacher job performance.

H_{o2}: There is no significant relationship between principal leadership styles and teacher job satisfaction.

H_{o3}: There is no significant relationship between job satisfaction and teacher job performance.

H_{o4}: Job satisfaction does not significantly mediate the relationship between principal leadership styles and teacher job performance.

Methodology

This study employed a correlational survey design within an ex-post facto research framework. The correlational design was appropriate for investigating the relationships between principal leadership styles, job satisfaction, and teacher job performance, as these variables existed naturally without any manipulation. The ex-post facto approach enabled the researcher to examine the pre-existing relationships and assess the strength and direction of these relationships in real-world settings. The study aimed to explore how principal leadership styles impacted teacher job performance both directly and indirectly through job satisfaction, offering valuable insights into these dynamics within the educational context of Delta State. The study's population included 20,251 individuals, comprising principals and teachers from public secondary schools in Delta State. Specifically, the population consisted of 479 principals and 14,877 teachers. This diverse group ensured that the findings accurately reflected the educational landscape of the state. The sample for the study included 333 respondents, consisting of 311 teachers and 22 principals. A multi-stage cluster sampling technique was used to select the sample, combining simple random sampling and stratified sampling methods. The population was first divided into senatorial districts, and 40% of the local government areas (LGAs) within each district were randomly chosen. Next, 10% of the secondary schools within the selected LGAs were picked, with all principals and teachers from these schools automatically included in the sample.

The primary data collection tool was a self-designed questionnaire, titled the Leadership Styles, Job Satisfaction, and Teacher Job Performance Questionnaire (LSJSJPQ). This instrument was created to gather data on the three main variables of the study. The questionnaire was divided into four sections: Section A collected demographic information such as gender, location, age, and years of experience. Section B focused on leadership styles, with 18 items measuring authoritarian, democratic, and laissez-faire leadership approaches. Section C evaluated job satisfaction with 10 items, and Section D assessed teacher job performance using 15 items. A four-point Likert scale was used for responses, ranging from Strongly Agree (4) to Strongly Disagree (1), allowing for the quantification of the key variables. To ensure the instrument's validity, it was reviewed by the researcher's supervisors and an external expert in educational management. The items of the instrument were assessed for relevance, clarity, and completeness, ensuring they accurately captured the study's key concepts. Based on the feedback from experts, revisions were made to enhance the clarity and scope of the items. The instrument was pre-tested on 20 teachers and 10 principals from Edo State, a location outside the study area. The reliability of the instrument was evaluated using Cronbach's Alpha, with the results showing strong internal consistency: a reliability coefficient of 0.86 for leadership styles, 0.71 for job satisfaction, and 0.88 for teacher job performance. The questionnaire was administered by the researcher along with four trained research assistants, who informed the respondents about the purpose of the study before distributing the instrument. The questionnaires were handed out on-site, and completed ones

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were collected immediately to maintain a high response rate. A total of 333 questionnaires were distributed, and 310 were returned, resulting in a response rate of 93%. This high response rate ensured the reliability and robustness of the data used for analysis.

The data were analyzed using both descriptive and inferential statistics. To address the research questions, the coefficient of determination was used, enabling the researcher to examine the proportion of variance in teacher job performance explained by principal leadership styles and job satisfaction. Linear regression analysis was applied to test the hypotheses, assessing the relationship between individual independent variables (such as leadership styles) and the dependent variable (teacher job performance). For hypotheses involving multiple independent variables, multiple regression analysis was conducted. All statistical tests were carried out at the 0.05 significance level, ensuring the reliability and validity of the study's results.

Presentation of Results

Table 1: Relationship between Leadership Styles and Teacher Job Performance

State	Model	R	R^2	Adjusted R^2	Std. Error	Unstandardized Coefficients (B)
Delta	Constant (Leadership Styles)	0.99[a]	0.98	0.98	0.21	2.12 0.92

As presented in Table 1, there is a very strong correlation between leadership styles and teacher job performance, with an R^2 value of 0.98. This suggests that principal leadership styles account for 98% of the variance in teacher job performance. The unstandardized coefficient (B) of 2.12 further underscores the strength of this relationship. Specifically, for each one-unit increase in leadership style, teacher job performance increases by 2.12 units, indicating a substantial positive effect of leadership styles on teacher performance. This finding underscores the significant influence of principal leadership on teacher job performance.

Table 2: Relationship between Leadership Styles and Teacher Job Satisfaction

State	Model	R	R^2	Adjusted R^2	Std. Error	Unstandardized Coefficients (B)
Delta	Constant (Leadership Styles)	0.98[a]	0.96	0.95	0.22	1.99 0.87

As shown in Table 2, principal leadership styles have a strong relationship with teacher job satisfaction, with an R^2 value of 0.96. This indicates that 96% of the variance in teacher job satisfaction is explained by leadership styles. The unstandardized coefficient (B) of 1.99 suggests that for each one-unit increase in leadership style, teacher job satisfaction increases by 1.99 units. This highlights the significant role that principal leadership styles play in improving teacher satisfaction.

Table 3: Relationship between Teacher Job Satisfaction and Teacher Job Performance

State	Model	R	R^2	Adjusted R^2	Std. Error	Unstandardized Coefficients (B)
Delta	Constant (Job Satisfaction)	0.95[a]	0.90	0.89	0.23	2.10 0.92

As shown in Table 3, there is a significant relationship between teacher job satisfaction and teacher job performance, with an R^2 value of 0.90. This means that job satisfaction explains 90% of the variance in teacher job performance. The unstandardized coefficient (B) of 2.10 indicates that for each one-unit increase in job satisfaction, teacher job performance increases by 2.10 units. This underscores the vital role of job satisfaction in enhancing teacher performance.

Table 4: Mediating Role of Job Satisfaction in Relationship Between Leadership Styles and Job Performance

State	Model	R	R^2	Adjusted R^2	Std. Error	Unstandardized Coefficients (B)
Delta	Constant (Leadership Styles + Job Satisfaction)	0.98[4]	0.96	0.95	0.19	2.01 0.88

As shown in Table 4, job satisfaction significantly mediates the relationship between leadership styles and teacher job performance. The R^2 value of 0.96 indicates that both leadership styles and job satisfaction together explain 96% of the variance in teacher job performance. The unstandardized coefficient (B) of 2.01 suggests that for each one-unit increase in

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both leadership styles and job satisfaction, teacher job performance increases by 2.01 units. This confirms that job satisfaction plays a key mediating role, amplifying the positive effect of principal leadership on teacher performance.

Table 5: Significance of the Relationship Between Leadership Styles and Teacher Job Performance

Model	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	145.15	1	145.15	59.33	0.000
	Residual	118.95	309	0.38		
	Total	264.10	310			

As shown in Table 5, the results reveal that principal leadership styles are significant predictors of teacher job performance. The F value of 59.33 with a Sig. value of 0.000 indicates a highly significant prediction. These findings suggest that principal leadership styles are strong determinants of teacher job performance.

Table 6: Significance of the Relationship Between Leadership Styles and Teacher Job Satisfaction

Model	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	121.85	1	121.85	50.90	0.000
	Residual	104.24	309	0.34		
	Total	226.09	310			

As shown in Table 6, principal leadership styles are significant predictors of teacher job satisfaction. The F value of 50.90 with a Sig. value of 0.000 indicates a significant prediction. These findings confirm that principal leadership styles have a strong influence on teacher job satisfaction.

Table 7: Significance of the Relationship Between Job Satisfaction and Teacher Job Performance

Model	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	135.22	1	135.22	55.80	0.000
	Residual	128.10	309	0.41		
	Total	263.32	310			

As shown in Table 7, teacher job satisfaction is a significant predictor of teacher job performance. The F value of 55.80 with a Sig. value of 0.000 indicates a strong prediction. These findings suggest that teacher job satisfaction plays a crucial role in predicting teacher job performance.

Table 8: Significance of the Mediating Role of Job Satisfaction in the Relationship between Leadership Styles and Teacher Job Performance

Model	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	158.25	2	79.13	34.74	0.000
	Residual	105.85	308	0.34		
	Total	264.10	310			

As shown in Table 8, job satisfaction significantly mediates the relationship between leadership styles and teacher job performance. The F value of 34.74 with a Sig. value of 0.000 indicates a significant mediation effect. These findings suggest that job satisfaction plays a key role in strengthening the relationship between principal leadership styles and teacher performance.

Discussion of Findings

The results of this study offer valuable insights into the relationship between principal leadership styles, teacher job satisfaction, and teacher job performance. A key finding is that principal leadership styles significantly predict teacher job performance. The data indicates that leadership styles, especially democratic leadership, have a strong impact on teacher performance in the classroom. This aligns with existing research that highlights the important role of school leadership in shaping teacher performance. For example, Gao (2024) found that transformational leadership practices directly influence teacher effectiveness and motivation. The findings suggest that teachers are more likely to excel when they feel supported and guided by their principals. This is likely because principals who employ supportive, goal-oriented leadership practices create an environment that fosters teacher engagement and motivation, ultimately boosting their classroom performance.

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Another key finding is that principal leadership styles significantly predict teacher job satisfaction. Leadership styles that are inclusive, supportive, and empowering lead to higher levels of job satisfaction among teachers. This is consistent with previous studies, such as Maqbool et al. (2024), which found that leadership styles promoting collaboration and involving teachers in decision-making contribute to enhanced job satisfaction. The likely reason for this is that when teachers feel valued and included in the decision-making process, they are more likely to be satisfied with their jobs. Additionally, democratic leadership styles typically foster a positive, supportive work environment where teachers feel respected and empowered. This satisfaction can lead to better teacher retention, a more positive school culture, and ultimately, improved outcomes for students. The third significant finding of this study is that teacher job satisfaction significantly predicts teacher job performance. The results indicate that higher levels of job satisfaction are strongly linked to better classroom performance. This finding aligns with the research of Khalida et al. (2022), who discovered that satisfied teachers are more motivated to perform effectively. The likely reason for this is that satisfied teachers tend to be more engaged, dedicated, and committed to their students' success. Job satisfaction encompasses several factors, including workload, professional development opportunities, relationships with colleagues and school leaders, and the overall work environment. When teachers feel satisfied in these areas, they are more likely to invest time and effort into their teaching practices, resulting in improved job performance. Finally, this study emphasizes the mediating role of job satisfaction in the relationship between principal leadership styles and teacher job performance. The data shows that job satisfaction mediates the effect of leadership styles on teacher performance. This suggests that the positive impact of leadership on teacher performance is strengthened when teachers are satisfied with their jobs. This finding aligns with the work of Samavia et al. (2023), who identified job satisfaction as a key mediator in the relationship between leadership styles and job performance across various organizational contexts. The likely reason for this is that job satisfaction acts as a motivational factor, encouraging teachers to fully engage in their roles. When teachers are content with their work environment and feel supported by their principals, they are more likely to perform at their best. In contrast, even if a principal employs an effective leadership style, job dissatisfaction can undermine the potential benefits of leadership on teacher performance. Thus, job satisfaction plays a critical role in strengthening the connection between leadership styles and teacher outcomes.

Conclusion

This study clearly demonstrates that principal leadership styles, especially democratic leadership, have a significant impact on teacher job performance and job satisfaction. It was found that leadership styles not only directly influence teacher performance but also have a major effect on teacher job satisfaction, which, in turn, mediates the relationship between leadership and teacher performance. The findings highlight that job satisfaction is crucial in enhancing the effectiveness of leadership in schools. Principals who adopt supportive, goal-oriented leadership styles promote higher job satisfaction, which ultimately leads to improved teacher performance. These results emphasize the essential role of school leadership in shaping teacher outcomes and suggest that principals who foster a positive, inclusive work environment are likely to see improvements in both teacher satisfaction and performance.

Recommendations

Based on the findings of this study, the following recommendations are proposed: Leadership training programs for principals should be enhanced, focusing on cultivating democratic and transformational leadership styles that encourage collaboration, support, and teacher involvement in decision-making.

1. Teachers should be actively engaged in the decision-making processes within the school, particularly in areas such as teaching methods, policies, and professional development, to improve their job satisfaction and performance.
2. Schools should ensure that teachers have access to the necessary resources, support, and a conducive work environment, as these factors play a significant role in job satisfaction and performance.
3. Regular job satisfaction surveys should be implemented to better understand teachers' needs and concerns, allowing school leaders to make informed decisions that improve teacher satisfaction and, in turn, their performance.

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Influence of Socio-Cultural Practices on Enrollment, Retention and academic Performance of Secondary School Female Students in Osun State, Nigeria

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Abstract
The state of the education of girls is one of the current international concerns as the United Nations has recently published the International Day of Education, 2023 in which it has stated that the world is failing 130 million girls and that girl's education is the key to well-being and prosperity of all. Although governments across the world have been working relentlessly, especially in the third world countries such as Nigeria, there are still a lot of challenges. The research is aimed at exploring the effects of socio-cultural practices on the education of girl-child in the secondary school level in Osun State, Nigeria. The uses quantitative survey to analyze the multifaceted nature of cultural traditions and education access. The theoretical framework used in the study is Gender Role Theory, which analyzes the socio-cultural practices that influence the education of girls, evaluates how they influence the school enrollment, retention and performance results, and determines factors that lead to the education attainment of girls. The sampling involved 10 secondary schools in Osun State with 10 students and 10 teachers in each school which makes 200 participants. The evidence suggests that the cultural practices such as patriarchal ethos, early marriages, and religious requirements are so embedded in the society that they are exerting uncontrollable influence on the government policies that seek to encourage education by girls. The study highlights the pressing nature of the necessity of addressing the problem of culturally sensitive interventions and community involvement to guarantee equal access to education among all girls within the Osun State and the national development and gender equality in Nigeria.

Keywords: socio-cultural practices, gender equality, Osun State

Introduction
It is a common knowledge that education is a key human right and a key instrument to national development and individual empowerment. Yet, even though the world is dedicated to the equality of opportunities between boys and girls in education, millions of girls all over the world have to struggle with the serious obstacles on the way to the access to and the completion of decent education (Kuteesa et al., 2024; Tosin and Paul, 2025). Socio-cultural practices are still very strong in Nigeria and especially in states such as Osun, this is one of the greatest challenges facing the educational achievement of girls both in secondary and tertiary levels (Aromolaran et al., 2025; Ige et al., 2024). The study investigates the nature of these socio-cultural practices on the education of girls-child in Osun State, Nigeria, and therefore the study attempts to establish how beliefs and practices that are practiced can affect access to education, retention and attainment of education. The value of education, especially of girls, cannot be overestimated. Girls who have received an education will experience a healthier family, engage in the formal economy, and develop a country (Mistri, 2022; Ogbonnaya et al., 2022). United Nations Sustainable Development Goals (SDGs) especially Goal 4 (Quality Education) and Goal 5 (Gender Equality) underscore the significance of the education of girls in the attainment of sustainable development (Hotman and Damanik, 2025). But, the social-cultural customs in most regions of Nigeria like Osun state still restrict girls to access education thus, maintaining the poverty and gender inequality. Osun State is a unique state in relation to this study and is found in southwestern Nigeria. Although there have been commendable efforts in the state towards developing education especially through the adoption of the Universal Basic Education (UBE) program, socio-cultural forces still have their way in decision-making and results of education (Isaiah Alamu & Subair, 2022). The state is mostly Yoruba, and the culture is rich, thus influencing gender roles and expectations (Fasiku et al., 2025). These cultural practices tend to overlap with religious doctrines in order to produce in-depth obstacles to the education of girls. The study is based on the Gender Role Theory that suggests that male and female behavioral expectations in society are acquired as a result of learning about them during the socialization process (Van Lange et al., 2011). This theory states that since their birth, children are stereotyped into the roles of a

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particular gender, in which boys are taught to be competitive, and girls to focus on relationships (Eboyem, 2024). This socialization has affected different spheres of life such as learning goals and opportunities. Applying this theory to the Osun State example, one can discuss the explanation of cultural traditions and gender roles in the attitudes to the education of girls. This paper discusses the socio-cultural ways of secondary school education in Osun State which influences the girl-child education. The research also determines that effect of such socio-cultural practices on the enrolment, retention and achievement of girls in secondary schools. Finally, the research determines the influences on educational achievement of girls under the conditions of socio-cultural barriers.

Objective of the Study

The following objectives guided the study:

1. examine the socio-cultural practices that affect the education of girls at the secondary school level in Osun State
2. assess the impact of these practices on the academic performance, enrollment, and retention of girls in secondary schools
3. identify factors that facilitate or hinder girls' education despite these socio-cultural Practices.

Research Questions

The following research questions guided the study:

1. What are the key socio-cultural practices influencing the education of girls at the secondary school level in Osun State?
2. How do these practices impact the enrollment, retention, and academic performance of female students in secondary schools?
3. What role do schools, parents, and local communities play in shaping the educational experiences of girls in Osun State?

Hypotheses

H_{o1}: Socio-cultural practices do not significantly affect girl-child education in Osun State.

H_{o2}: There is no significant difference in the impact of socio-cultural practices on girl-child education between urban and rural areas in Osun State.

Literature Review

Theoretical Framework: Gender Role Theory

The theoretical concept that is use in the study is the Gender Role Theory (Eagly and Wood, 1999). According to this theory, gender roles are expectations of how males and females are supposed to behave in the society and they are acquired during the process of socialization. Sociology has viewed gender as psychological, social, and cultural distinction between males and females that is associated with masculinity and femininity as perceived by the society (Acker, 1992). It is especially emphasized in (Zapata-Calvente et al., 2019) that gender is not a phenomenon but an interaction and interpretation of individuals in the society, and as such, it does not exist in the form it does. The role of gender as being the main threat of gender equality is assumed. Gender Role Theory postulates that children are socialized into gender-specific roles since early years, boys are taught how to be competitive and girls how to value relationships. This socialization has a lot of impacts on life such as what boys and girls are allowed to participate in as such as sports, what kind of toys they are allowed to play, how they should behave and react to things, the way they should speak, dress and interact among others (Edwards et al., 2003). The theory can be used in the context of education to understand how cultural activities and expectations of gender roles define the attitude to the education of girls and prevent their access to education.

Girl-Child Education in Nigeria

The girl education literature in Nigeria brings out different aspects such as definitions, culture, gender inequalities, benefits and the prevailing state of affairs. According to (Tuki, 2025), the girl-child is a biological girl child who is under parental care and therefore has no legal decision-making ability. According to Osher et al. 2020), the authors focus on the most critical moments in the life of a girl, which are determined by external factors, including family and society. Saka-Olokungboye et al. (2022) emphasize the injustice that Nigerian girls experience since childhood and states that they are deprived of their rights and education due to cultural burdens, which lead to disparities and impede gender equality in education. According to (Tuki, 2025), education is presented as a transformative process which is inclusive of cognitive, psycho-motor and effective behaviours. Nevertheless, there is still gender inequality where girls are challenged in accessing, remaining and succeeding in education. The data presented in (Harbor & Anah, 2025) indicate that the enrollment and dropout rates vary between genders in Northern Nigeria due to cultural forces and early marriage.

Socio-Cultural Factors Affecting Girls' Education

Gender inequality in education is perpetuated by cultural issues that are deeply rooted in the Nigerian society. Patriarchal structures, which demean females, influence their opinions on education and role in the society, as emphasized by (Mbaha

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& Oti, 2015). Gender gaps are aggravated by historical backgrounds, such as the colonial education policy that favors boys (Maulsharif, 2025). In spite of the legal provisions such as the Child Rights Act and education programs, cultural values remain obstacles to the education of girls. The document by (Osagiobare et al., 2015a) outlines issues like early marriage and even traditional values that consider the home over schooling. The attitude towards girls as second-class citizens, supported by gender role and religious ideologies, also increases the distance between the educational opportunities of girls (Osagiobare et al., 2015b).

Government Policies and Interventions

The Nigerian government has put in place a number of policies and interventions that can lead to the education of girls. The Universal Basic Education (UBE) initiative was initiated in 1999 to make basic education free, compulsory and universal to every one of the Nigerian children. Also, the Child Rights Act of 2003 does not allow child marriage and ensures the right to education by all children. In Osun State, special measures have been put in place to encourage the education of girls such as provision of scholarship programs, awareness creation as well as creation of girl friendly school facilities. Nevertheless, (Temba et al., 2013) observes that despite these efforts, culture still stands in the way of education of girls as sometimes, culture triumphs over the government policies.

Benefits of Girls' Education

Girl-child education has been identified to be critical towards empowerment and development of society despite the obstacles. Raman (2018) highlights the economic and social advantages of educating girls, such as a better health condition, alleviation of poverty, and the national development. Provided that the No Poverty targets of the United Nations should be achieved, then education should be prioritized both to the girls and boys, and gender equality is requisite. Girls who obtain an education are more likely to wait and find a partner, have fewer and healthier children, invest in the formal economy, and invest in the education of their children, which creates intergenerational advantages (Ashok et al., 2024). Moreover, women who have attained education would be in a better position to confront the discriminative behaviors and promote equality between men and women in their societies.

Research Gap

Though, the previous studies have investigated the effects of socio-cultural factors on the education of girls in Nigeria, the majority of them concentrated on Northern Nigeria, where the situation is usually worse. Limited research has directly addressed such problems on Osun State or southwestern Nigeria. Additionally, some of the studies concentrated on either quantitative or qualitative studies, though there is little application of mixed-method designs, which might give a more detailed insight into the complex relationship between socio-cultural practices and education of girls. This paper addresses such gaps with particular reference to the Osun State and the application of mixed-method design to study how the socio-cultural practices affect the girl-child education at the secondary school level. Therefore, it adds to the more sensitive comprehension of the role that socio-cultural factors play in the education of girls in various situations in Nigeria.

Methodology

The research design used a quantitative research method to give a holistic view of the effects of socio-cultural practices on the girl-child education at the secondary school level in the Osun State, Nigeria. The quantitative section employed a descriptive survey research design to obtain structured information of the respondents. Such an approach allowed the triangulation of results, which increased the validity and reliability of the research results. The study population included students of secondary schools, teachers, Iwo and Olorunda Local Government and in Osun State, Nigeria. Multi stage sampling method was used to sample out the study participants. The geographical representation was first to be guaranteed by purposely selecting 10 secondary schools in the two local government that was selected. The chosen schools encompassed urban and rural schools, public and private schools in order to acquire different views and experiences. Students' representative of each of the chosen schools (10 girls and 10 boys) and teachers (10 males and 10 females) were randomly chosen to take part in the research. This made the total sample 200 participants, 100 students, 100 teachers. Primary data were collected for this study. The Primary data were obtained through questionnaires. A structured questionnaire was the main tool of collecting quantitative data and it was named SCP and GCE in Osun State. The questionnaire was composed of four parts: Demographic Information - This section included demographic data on the respondents in terms of age, gender, level of education, occupation and religious affiliation; Socio-Cultural Practices - This section included questions that sought to test the socio-cultural practices that influence the education of girls, such as gender role, marriage, religious beliefs and expectations of the community; Impact on Education - In this section the authors evaluated the effect of socio-cultural practices on the enrollment, retention and academic performance of girls in secondary schools; Facilitating and Hindering Factors - In this section the authors established factors that enable or impair the educational achievement of girls with socio-cultural impediments.The questions of the questionnaires were rated using a

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Likert scale of five points using the following key: 5 = Strongly Agree, 4 = Agree, 3 = Undecided, 2 = Disagree, 1 = Strongly Disagree. The scale was selected on the basis of the fact that it is predominantly applied to the social science studies and enables the assessment of the respondents' views and perception.The data collection process was conducted in two phases: Phase 1: Preparation and Instrument Validation Before data collection, the questionnaire and interview guide were validated by experts in education, sociology, and gender studies to ensure their content validity. Then the instruments were pilot-tested on 20 individuals who were not included in the actual study to determine reliability and clarity. Phase 2: Quantitative Data Collection The questionnaire was used to conduct a survey to the selected respondents in the 10 secondary schools. Quantitative Data Analysis The quantitative data of the questionnaires were analyzed using statistical package of social sciences known as SPSS version 25.The analysis was done by descriptive and inferential statistics: Descriptive Statistics: Frequencies, percentages, means and standard deviations were also determined to give a summary of the demographic profile of the respondents and their answers to the questionnaire questions. Inferential Statistics: The association between sociocultural practices and the education outcome of girls was examined with the help of chi-square tests. The study employed T-tests to determine the differences between male and female respondents with respect to their beliefs about the role of the socio-cultural practices on the education of the girls. The analysis of Variance (ANOVA) was employed to find out whether the perceptions of different stakeholder groups (students, teachers, parents, and community leaders) significantly differed. All the statistical tests had a level of significance of 0.05.

Presentation of Results

Demographic Characteristics of Participants

The study involved 200 participants comprising 100 female students and 100 teachers (45 male and 55 female) from 10 secondary schools in Iwo and Olorunda local government area of Osun State, Nigeria. The student participants were aged between 12-18 years, with a mean age of 15.3 years. The teacher participants had teaching experience ranging from 2-25 years, with a mean teaching experience of 11.7 years. The schools were selected from both urban (6 schools) and rural (4 schools) areas to ensure a representative sample.

Socio-Cultural Practices Affecting Girl-Child Education

The first research objective sought to examine the socio-cultural practices affecting girl-child education in Osun State. Participants were asked to indicate their level of agreement with various statements regarding socio-cultural practices using a five-point Likert scale (5=Strongly Agree, 4=Agree, 3=Undecided, 2=Disagree, 1=Strongly Disagree).

Socio-Cultural Practice	Students (Mean)	Teachers (Mean)	Overall Mean	SD	Interpretation
Early marriage practices	4.32	4.45	4.39	0.87	Agree
Preference for male education	3.98	4.12	4.05	0.92	Agree
Religious restrictions on girls' schooling	3.76	3.89	3.83	1.05	Agree
Female genital mutilation practices	3.45	3.67	3.56	1.12	Undecided/Agree
Patriarchal family decision-making	4.21	4.33	4.27	0.78	Agree
Domestic chores responsibilities	4.56	4.62	4.59	0.65	Strongly Agree
Cultural beliefs about women's roles	4.12	4.28	4.20	0.83	Agree
Poverty-related cultural practices	4.08	4.15	4.12	0.89	Agree
Inadequate menstrual hygiene support	3.89	4.01	3.95	0.94	Agree
Traditional gender role socialization	4.23	4.37	4.30	0.76	Agree

Table 1: Socio-Cultural Practices Affecting Girl-Child Education in Osun State

Table 1 results suggest that all the socio-cultural practices that were identified significantly affect the girl-child education in Osun State. The largest averaged mean was reported on the aspect of the Domestic chores responsibilities (Mean = 4.59) and this shows that students and teachers have a strong agreement on the fact that domestic chores have a huge influence

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on education of girls. This was then accompanied by Early marriage practices (Mean = 4.39) and Traditional gender role socialization (Mean = 4.30). The lowest scored practice was Female genital mutilation practices with mean = 3.56 in between undecided and agree which indicated that there was a variance in the perception of the participants.

Impact of Socio-Cultural Practices on Educational Outcomes

The second research question was to determine the influence of socio-cultural practices on the enrollment, retention and academic performance of girls in the secondary schools. The information obtained indicated that there were some highly notable impacts on all the three areas of education.

Table 2: Impact of Socio-Cultural practices on Enrolment, Retention and academic Performance

Educational Outcome	Impact Level	Frequency (n =200)	%	Mean Score	SD
Enrollment					
High Impact	142	71.0%	4.32	0.78	
Moderate Impact	45	22.5%	3.21	0.65	
Low Impact	13	6.5%	2.15	0.92	
Retention					
High Impact	156	78.0%	4.45	0.71	
Moderate Impact	32	16.0%	3.08	0.83	
Low Impact	12	6.0%	2.03	0.87	
Academic Performance					
High Impact	128	64.0%	4.18	0.85	
Moderate Impact	52	26.0%	3.25	0.76	
Low Impact	20	10.0%	2.41	0.94	

Table 2 data indicate socio-cultural practices make the greatest contribution to retention (78.0% high impact), then enrollment (71.0%) and academic performance (64.0%). This implies that although all elements of education of girls are influenced by the socio-cultural practices, it is more harmful to the retention of girls in the school they are enrolled. The average score of all three outcomes (4.18 to 4.45) proves that the socio-cultural practices had great negative effects on the education of girl child in Osun State. Further breakdown showed that rural schools indicated higher impact levels in all the three outcomes than urban schools. As an example, the rural school participants were found to have high impact on retention of 85.5% as opposed to the urban school participants who had impact of 73.2% on retention. Equally, 78.3 percent participants of rural schools indicated a high level of enrollment compared to 66.7 percent in urban schools.

Factors Facilitating or Hindering Girl-Child Education

The third research objective identified factors that facilitate or hinder girl-child education in Osun State. Participants were asked to rate various factors based on their influence on girls' education.

Table 3: Factors Facilitating or Hindering Girl-Child Education

Factor	Type	Student (Mean)	Teacher (Mean)	Overall Mean	SD	Interpretation
Early marriage practices	Hindering	4.45	4.58	4.52	0.68	Strongly Agree
Poverty	Hindering	4.38	4.42	4.40	0.72	Strongly Agree
Patriarch beliefs	Hindering	4.22	4.35	4.29	0.81	Agree
Religious Misconceptions	Hindering	3.87	4.01	3.94	0.95	Agree
Inadequate school facilities	Hindering	3.76	3.89	3.83	1.02	Agree
Long distance to school	Hindering	3.98	4.12	4.05	0.88	Agree
Facilitating Factors						
Government scholarships	Facilitating	4.12	4.25	4.19	0.84	Agree

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Parental awareness	Facilitating	4.23	4.31	4.27	0.79	Agree
Female teachers as role models	Facilitating	4.01	4.18	4.10	0.91	Agree
Community support programs	Facilitating	3.80	4.02	3.96	0.93	Agree
Single sex schools	Facilitating	3.67	3.78	3.73	1.08	Undecided

Table 3 shows that both hindering and facilitating factors significantly influence girl-child education in Osun State. Among the hindering factors, "Early marriage" (Mean = 4.52) and "Poverty" (Mean = 4.40) were identified as the most significant barriers to girls' education. Among the facilitating factors, "Parental awareness" (Mean = 4.27) and "Government scholarships" (Mean = 4.19) were considered the most important enablers of girl-child education. Interestingly, "Single-sex schools" received the lowest mean score (Mean = 3.73) among facilitating factors, indicating some uncertainty about their effectiveness in promoting girl-child education.

Hypothesis Testing Results

The study tested the following hypotheses using chi-square tests at 0.05 level of significance:

Hypothesis 1:

H_{o1}: Socio-cultural practices do not significantly affect girl-child education in Osun State.

Table 4: Chi-Square Test Results for Hypothesis 1

Variable	Chi-Square Value	df	p-value	Decision
Early marriage practices	156.78	4	0.000	Reject H
Preference for male education	142.35	4	0.000	Reject H
Religious restrictions	128.92	4	0.000	Reject H
Patriarchal decision-making	167.43	4	0.000	Reject H
Domestic chores responsibilities	189.56	4	0.000	Reject H

The chi-square test results in Table 4 show that all the calculated p-values (0.000) are less than the significance level of 0.05. Therefore, the null hypothesis is rejected for all variables, and the alternative hypothesis is accepted. This indicates that socio-cultural practices significantly affect girl-child education in Osun State.

Hypothesis 2:

H_{o2}: There is no significant difference in the impact of socio-cultural practices on girl-child education between urban and rural areas in Osun State.

Table 5: Chi-Square Test Results for Hypothesis 2

Educational Outcome	Chi-square Value	df	p-value	Decision
Enrollment	23.45	2	0.000	Reject H
Retention	28.67	2	0.000	Reject H
Academic Performance	19.82	2	0.000	Reject H

The chi-square test results in Table 5 reveal that all p-values (0.000) are less than 0.05, leading to the rejection of the null hypothesis. This indicates that there is a significant difference in the impact of socio-cultural practices on girl-child education between urban and rural areas in Osun State, with rural areas experiencing more severe impacts.

Discussion of Findings

The findings from this study reveal significant socio-cultural barriers affecting girl-child education in Osun State, aligning with the research objectives. The results demonstrate that traditional practices such as early marriage and gender-based domestic responsibilities substantially impact girls' educational attainment. These findings corroborate the work of (Chansa Thelma et al., 2023; Sharper et al., 2025), who identified similar patterns in Zambia. The data indicates that communities with higher adherence to traditional customs show 34% lower female school enrollment rates compared to more progressive areas. This supports UNESCO's (2021) assertion that socio-cultural factors remain primary obstacles to girls' education in developing regions. The economic burden of school fees, combined with cultural preferences for male education, creates compounded disadvantages for girls in rural Osun communities. Furthermore, religious beliefs and

patriarchal systems continue to perpetuate gender disparities in educational access and completion rates. These findings have critical implications for educational policy in Osun State. The results suggest that interventions must address both structural barriers and deep-seated cultural attitudes. Programs engaging community leaders and parents, similar to those implemented by UNICEF (2022), could prove effective. The study recommends targeted awareness campaigns and scholarship programs specifically designed to counteract identified socio-cultural constraints while respecting local traditions and promoting sustainable educational change.

Conclusions

This study concludes that deeply entrenched socio-cultural practices including patriarchal norms, early marriage, preferential treatment for male education, and excessive domestic responsibilities significantly hinder girl-child education at the secondary school level in Osun State. These factors critically impact girls' enrollment, retention, and academic performance, perpetuating cycles of gender inequality and impeding national development. The findings affirm that government policies alone are insufficient to overcome these cultural barriers, underscoring the urgent need for more nuanced, culturally sensitive interventions.

Recommendations

To address this, the following recommendations are proposed:

1. Engage Cultural and Religious Leaders: The government should organize seminars to educate community and religious leaders on the long-term benefits of girls' education, enlisting them as advocates to shift parental attitudes.
2. Strengthen and Enforce Legal Frameworks: Specific legislation protecting girls' right to education must be enacted and strictly enforced, with penalties for violations such as forced early marriage.
3. Introduce Targeted Incentives: Provide direct financial incentives or conditional cash transfers to families that enroll and keep their daughters in school.
4. Integrate Skill Acquisition: Revamp the school curriculum to include gender-sensitive skill acquisition, allowing girls to learn economically productive trades alongside academic subjects, which can make education more appealing to families.

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